

**BLENDED TEACHING AND LEARNING IN A
NEW ZEALAND RURAL SECONDARY
SCHOOL: USING AN ECOLOGICAL
FRAMEWORK**

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Abstract

Blended online teaching and learning is a fast developing area for educational providers around the world. In New Zealand, the Virtual Learning Network enables students from more than 250 schools to experience blended learning, by enrolling in blended distance courses in addition to the face-to-face courses that their home schools offer. More and more teachers across the country also implement online content in their face-to-face teaching, experimenting with a variety of tools and offering blended web-enhanced courses to their students. The rollout of Ultra Fast Broadband is expected to increase the uptake of blended approaches in schools across the country. School wide implementation of blended teaching learning is expanding, but it is challenging even for schools that have been part of a rural e-learning cluster for many years. The need to investigate how blended teaching and learning is implemented in schools is increasing to identify the implications for students, teachers, school leaders and other educational stakeholders.

A case study methodology was applied to investigate how blended teaching and learning was implemented in 2011 in a New Zealand rural secondary school that was one of the early adopters of blended approaches. Data collection methods included interviews with the ePrincipal of the school's e-Learning cluster, the school principal and six teachers using blended approaches, observations in one blended web-enhanced class, group interviews with six students from the same class, as well as a review of documents and web resources.

The findings focus on the uptake of blended teaching and learning at the school, the support that the school received from its e-Learning cluster and the support the school offered to teachers. School leaders' and teachers' vision for student learning was also examined, along with teachers' practices with blended approaches, the advantages and challenges that participants observed and/or experienced, as well as the school's future directions regarding blended teaching and learning.

The study is the first to apply Davis's (2008, in press) arena of change with digital technologies in education to present the complexity of change with blended teaching and learning in a secondary school. The roles of multiple stakeholders and their organizations impacting on and being impacted by the development of blended teaching and learning, including students, teachers, other teaching staff, school leaders, parents/community, professional, commercial/OER (Open Educational Resources), bureaucratic and political organizations are discussed. A coherent set of recommendations are made for all levels in the multilevel ecological hierarchy, including school leaders and policy makers.

Glossary

This section includes an overview of some key terms used in this research, clarifying their meaning for this particular study:

Asynchronous	Online interaction and information sharing between individuals/groups, taking place at separate time and place (e.g. email communication, interaction in Learning Management Systems).
Blended teaching and learning	<p>In the literature, online learning is a term that is used to refer to “learning that takes place partially or entirely over the Internet” (Means, Toyama, Murphy, Bakia, & Jones 2009, p.9), which may have two different purposes: “Learning conducted totally online as a substitute or alternative to face-to-face learning [or] online learning components that are combined or blended (sometimes called “hybrid”) with face-to-face instruction to provide learning enhancement”. (p.9)</p> <p>In this study the term <i>blended teaching and learning</i> is used to refer to a type of online education, where there is a combination of online learning components not solely with face-to-face instruction, but also with other forms of learning; for example, this research focuses on two blended approaches:</p> <ol style="list-style-type: none"> <i>Blended distance</i> teaching and learning, referring to the combination of online distance teaching and learning (often through video conference with an eTeacher) with self-study at the school or at home (often with the use of an online learning environment for scaffold) that also involves asynchronous communication with the eTeacher. <i>Blended web-enhanced</i> teaching and learning, referring to the use of online content as a way to enhance face-to-face teaching and learning. <p>This study often makes a distinction between <i>blended teaching</i> and <i>blended learning</i>, depending on whether the focus is on teachers’ or students’ experience with blended approaches.</p>
eDean	In New Zealand, students who study blended distance courses through the national Virtual Learning Network (VLN), have the support and guidance of an onsite facilitator at their school, often called the eDean.
e-Learning	In this research, this term is used to refer to “Learning and teaching that is facilitated by or supported through the smart use of information and communication technologies” (Ministry of Education, 2006, p.2)
e-Learning	A cluster of schools in New Zealand that collaborate to provide blended

cluster	distance courses to students. In 2011 there were 18 geographic e-Learning clusters in New Zealand (Barbour, Davis & Wenmoth, 2011).
eTeacher	A teacher who teaches a blended distance course. In the New Zealand context, the eTeacher is often not at the same school as his distance students.
ePrincipal	e-Learning leader of the e-Learning cluster
Synchronous	Online interaction and information sharing between individuals/groups, taking place in real time and at separate place (e.g. interaction through video conference).

Table 1. Clarification of key terms

Chapter 1: Introduction

Blended teaching and learning is a fast developing area in educational provision across the world (Horn & Staker, 2011). In New Zealand, hundreds of students are currently enrolled in Virtual Classrooms, managed by the Virtual Learning Network (VLN) that joins 18 geographic e-Learning clusters of schools and enables them to develop online learning programmes with the use of both synchronous and asynchronous methods (Barbour, et al., 2011; Bolstad & Lin, 2009). Students in these courses have the opportunity to experience blended distance learning (see *Glossary*), as they combine online distance learning through video conference with their eTeacher and asynchronous online learning at their school (or home) with the support of an onsite facilitator, often called the eDean. Concurrently, another blended approach has also been developing in New Zealand, where teachers implement online content to enhance their face-to-face classes, enabling students to experience blended web-enhanced learning (see *Glossary*). “What is evolving is a new form of “blended education” which draws on the methodologies of both face-to-face and distance education” (Browning, 2005, p.3). With the New Zealand Government's current initiative to equip 95% of schools and 75% of homes with Ultra Fast Broadband (UFB), blended teaching and learning is expected to further grow in schools across the country (Davis, 2011b) (see also Ministry of Education, 2012).

E-Learning, including the use of blended approaches, is regarded as a means for educational reform, as it can be used as a way “to help develop new kinds of curriculum and pedagogy that will both respond to and reshape the 21st century world” (Bolstad, Gilbert, Vaughan, Darr & Cooper, 2006, p.25). However, given the complexity of educational change with Information and Communication Technologies (ICT) (Davis, 2008, in press), the effective implementation of blended school education is a complex process, involving many implications for teachers, students, school leaders and other educational stakeholders. Therefore, researching the ways through which blended teaching and learning is implemented in schools and the related implications for key stakeholders is necessary, to raise discussion on effective practices that will inform professional and organizational development. However, despite the growth of blended school education internationally, the body of literature on blended teaching and learning in primary or secondary education contexts is still weak, compared to research on tertiary institutions (Means et al., 2009). In New Zealand in particular, further research on blended teaching and learning in schools is needed, in order to inform professional and organisational development at a time when the government is implementing UFB in schools (UFBIS). In addition, the need to provide students with more flexible learning opportunities is evident, given the disruption caused, but not limited to schools by natural hazards (e.g. earthquakes in Canterbury, 2010-2011) (Parkes, Zaka & Davis, 2011).

Given the growth of blended school education in this context, the gap in the literature on blended school education (Cavanaugh, Barbour & Clark, 2009) as well as the importance of sharing evidence on teaching experiences (Ministry of Education, 2006), a case study was carried out to provide a rich and in depth description on the use of blended teaching and learning in one New Zealand secondary school. Case studies allow for collection of rich descriptive data that are highly relevant to reality, therefore providing “a natural basis for generalization” (Cohen, Manion & Morrison, 2007, p.256).

In this case study the ways through which blended web-enhanced and blended distance teaching and learning (see *Glossary*) are implemented in a rural New Zealand secondary school are investigated. A deeper understanding of the practices that are undertaken to facilitate the process of implementation, the positive outcomes and challenges that emerged and the school leaders’, staff and students’ experiences throughout the process are provided. The research focuses on one single case of a rural secondary school in New Zealand and an embedded case of one blended web-enhanced class in the school.

The main question of this case study is:

How is blended teaching and learning implemented in a rural New Zealand secondary school?

The sub-questions are:

- How do school leaders experience the implementation of blended teaching and learning at the school?
- How do teachers experience the implementation of blended teaching and learning at the school and what are their practices with blended teaching in their classes?
- What are the practices in one blended class and how do the teacher and the students experience blended teaching and learning in the same class?
- What are the implications of implementing blended teaching and learning for students, teachers, school leaders and other educational stakeholders?

As with any other case study, the findings of this research are grounded in the specific case and therefore have limited generalizability. However, this study can contribute to the body of empirical literature on blended school education in New Zealand and globally. Being a case study, it provides a rich description of the selected case, enabling the reader to make generalizations for similar contexts. “Case studies are of value for refining theory and suggesting complexities for further investigation, as well as helping to establish the limits of generalizability” (Stake, 2003, p. 156).

In this chapter, a very brief overview of the research rationale and context of the study was provided. Chapter 2 provides a review of the literature. Following an introduction to the changes in the educational landscape and the role of ICT and its potential for educational change, the role of

online/blended teaching and learning is further discussed, informed by current and relevant literature on online/blended school education. The advantages-challenges that are often identified are then presented. Taking an ecological perspective to indicate the multiple stakeholders and organizations that impact/are impacted from change with blended teaching and learning in the school, the review concludes with a discussion on the complexity of change with blended teaching and learning, the involved implications for multiple stakeholders and organizations and the need for further research on blended school education to inform professional and organizational development.

In Chapter 3, the Methodology of the research, a description of the qualitative case study design is provided. The aim was to research blended teaching and learning (blended distance and blended web-enhanced) in a case study of one rural secondary school in New Zealand (main case), with an embedded case of one blended web-enhanced class. An overview of the participants and setting, data collection methods and analysis, discussion on the validity, reliability and ethical considerations of the research are also provided.

In Chapter 4 the findings of the case study are presented, beginning with the school's context and the support and vision encouraged by the school's e-Learning cluster, through an interview with the ePrincipal and data from documentary resources. The current state of blended teaching and learning across the e-Learning cluster is also outlined. The school and its culture are then presented, including a description of the school principal and his vision, the use of blended teaching and learning at the school in general and the professional development and support provided to teachers. Teacher participants and their vision are then described, including two eTeachers teaching blended distance courses through the VLN, one of whom was also the eDean of the school, as well as four more teachers implementing blended web-enhanced teaching and learning in their face-to-face courses. A more detailed view of the practices undertaken in the embedded case of one Year 9 class, where blended web-enhanced approaches were used, is also provided, based on observations in the class, an interview with the class teacher, group interviews with six students and a review of documentary resources. The advantages and challenges that participants observed/experienced are then outlined, based on data from the main and embedded cases. The chapter concludes with an outline of the school's future plans regarding blended teaching and learning.

The research findings are discussed in Chapter 5, using an ecological framework to describe blended teaching and learning at the school, with a review of the implications for students, teachers, school leaders and other educational stakeholders, linked back to the literature.

Finally, Chapter 6 concludes this thesis, by summarizing the main points of the study and providing recommendations for practice and future research.

Chapter 2: Literature review

Introduction

In this chapter the review of the literature begins with a brief description of the new role of education in the Knowledge Society, as well as the role of ICT in this context. The growth of online/blended teaching and learning in educational providers across the world and in New Zealand is then described with a particular focus on blended school education, including the advantages and challenges that are reported through the literature. The chapter concludes with a discussion on the complexity of blended teaching and learning implementation in schools and the implications for research.

2.1. Education and ICT in the Knowledge Society

Current changes in our society landscape are transforming the meaning of knowledge, which in turn leads to the need for substantial reforms in education, as well as a shift in the role of the teacher and the students (Gilbert, 2005; Hargreaves, 2003; Andreotti & Souza, 2008). Schools, no longer positioned in the Industrial Age where knowledge was considered an end in itself, are expected to provide to the students educational experiences and skills that address the needs of the Knowledge Society.

In the Knowledge Society, knowledge is a process, rather than a product, acting more as a verb, rather than a noun; it is generated collaboratively and cannot be classified into disciplines. Knowledge is replaceable and develops as and when needed. Learning involves knowledge generation, not accumulation and occurs in authentic contexts. Finally, learners are not *tabulae rasae*, but their minds are resources that can collaboratively create new knowledge (Gilbert, 2005). An individual's ability is no longer determined by what they know and their access to information, but is based on what they can do with their knowledge and their capacity to process information (Hargreaves, 2003). In a nutshell, the different meaning of knowledge can be summarized in that in the Knowledge Society, it is not the *what*, but the *so what* that matters.

The new meaning of knowledge is reshaping the roles of education, the teacher and the student (Gilbert, 2005; Hargreaves, 2003; Andreotti & Souza, 2008). The last is more actively engaged in the learning process, facilitated by the teacher who is no longer in the centre of instruction. Research scholars such as Fullan (2001), Hargreaves (2003), Garrison and Anderson (2003) have argued the need to enable students to develop special kinds of skills, that are mainly focused on knowledge generation, collaboration, higher order thinking and lifelong learning, which are all necessary skills for the Knowledge Society.

According to Fullan (2001) knowledge generation, inquiry learning and sharing will help students to develop problem solving skills. Hargreaves (2003) adds that schools will shape today's world, by preparing future citizens to become more adaptive and flexible in a world that is rapidly changing, as well as by enabling them to develop their creativity and appreciate the value of collaboration. Hargreaves (2003) further acknowledges that teaching in the Knowledge Society needs to involve development of special capacities for students and teachers, such as

deep cognitive learning, creativity and ingenuity among pupils; drawing on research, working in networks and teams and pursuing continuous professional learning as teachers; and promoting problem-solving, risk-taking, trust in the collaborative process, ability to cope with change and commitment to continuous improvement as organizations. (p.18).

Garrison and Terry Anderson (2003) argue that students have to become “self-directed learners with the motivation and ability to be both reflective and collaborative and, ultimately, with the motivation to continue to learn throughout their lives” (p.20). Similarly, Ronald Anderson (2008) summarizes the implications of the demands of the Knowledge Society in teaching and learning, presenting some of the skills that students are required to have in this context, including knowledge generation, adaptability to rapid changes, information management, critical thinking and teamwork.

Anderson (2008) also discusses the importance of helping students to develop ICT related skills, which may include finding, organizing, retrieving information and ICT usage. Apparently, the changes in our economic and knowledge landscape highlight the need not only to enable students to become autonomous lifelong learners, but also to develop as proficient e-learners, as many information sources will be accessed digitally (Wright, 2010; Davis & Fletcher, 2010). In this context, Davis (2008) suggests that

Educators share the moral goal of supporting all the students to achieve their potential while working within our societies that are changing rapidly with technological and economic forces. In these circumstances, teacher learning with IT for educational renewal has an increasingly significant influence on society. (p.517).

In New Zealand in particular “the message is clear: New Zealand is moving towards a digital future, and schools are expected to play a major role in shaping and supporting this future” (Bolstad et al., 2006, p.1).

In this context, the role of ICT becomes more and more important, as it is already transforming many aspects of our society and is also considered a means for educational reform (Collins & Halverson, 2009; Davis, 2008; Gilbert, 2005; Garrison & Anderson, 2003). Bolstad et al. (2006) in particular argue about the potential of ICT “to help develop new kinds of curriculum and pedagogy that will

both respond to and shape the 21st-century world” (p.25), in addition to enhancing existing practices and providing efficient, accessible and engaging ways of teaching and learning. Many authors discuss the benefits of the educational use of ICT in the Knowledge Society that may include:

- enhancement of interactions and collaborative generation of knowledge (Garrison & Anderson, 2003; Scardamalia & Bereiter, 2006),
- development of multi-modal literacy (Collins & Halverson, 2009; Gilbert, 2005) and
- encouragement of self-directed and personalized learning, with the potential to enable students to become active lifelong learners, rather than passive consumers of knowledge (Christensen, Horn & Johnson, 2008; Gilbert, 2005; Garrison & Anderson, 2003; Scardamalia & Bereiter, 2006).

2.2. Online/blended school education

ICT has enabled educational providers to develop online teaching and learning, either with fully online courses that use online tools as a means to replace face-to-face teaching and learning or blended/hybrid courses where online content is used as a means to enhance face-to-face teaching and learning (Means et al., 2009). The Virtual Schools and Colleges project (VISCED) provides an online inventory with information about more than 350 virtual schools in countries across the world, with an expected increase in numbers of virtual schools in Australia, Brazil, Canada, New Zealand, South Africa, Turkey and USA (VISCED, 2012). There is also an international indication that blended education, where online content is used to enhance face-to-face teaching and learning, is a fast developing area in schools across the world (Condie & Livingston, 2007; Horn & Staker, 2011).

Referring to data from an international survey on online education policies and activity in 15 different countries (Powell & Patrick, 2006), Powell and Barbour (2011) conclude that online education is often seen as a means for educational reform, modernisation of schools and increased access to a world class education.

2.2.1. The New Zealand context

In New Zealand, a commonly used term to refer to ICT use in the classroom is e-Learning, describing “learning and teaching that is facilitated by or supported through the smart use of information and communication technologies” (Ministry of Education, 2006, p.2). The New Zealand Curriculum (Ministry of Education, 2007) clearly highlights the role of e-Learning and its pedagogical purpose that includes the provision of equitable and flexible access to information, encouragement of community building, supportive learning that considers student differences (e.g. individual, cultural, developmental) and extended learning opportunities.

E-Learning has been one of the most important priorities of the New Zealand Ministry of Education for the last ten years (Powell & Barbour, 2011) and there have been several governmental initiatives that have supported and continue to support the implementation of ICT in schools, including the use of online teaching and learning approaches.

In New Zealand the Ministry laid the foundation and created a framework for implementing e-Learning solutions, such as online learning [...]. New Zealand has made great progress in implementing online learning at the secondary and, more recently, primary levels—and this progress has been facilitated by the government's policies related to e-Learning (Powell & Barbour, 2011, p.85).

Initiatives such as the *TELA Programme - Laptops for Teachers* and the *ICT Professional Development* initiative, have contributed to the provision of adequate infrastructure and training to schools and teachers. According to reports on these initiatives, positive outcomes included, among others, the enhancement of teachers' confidence in their technology related skills, their use of ICT for educational purposes, as well as the quality of technology mediated teaching (Cowie et. al., 2008; Sahin & Ham, 2010).

In 2006, the Ministry of Education launched the *New Zealand e-Learning Action Plan for Schools 2006-2010*, focusing on enabling students to develop 21st century learning skills, to become confident, capable users of technology, who can effectively use ICT across the curriculum. This action plan encouraged the implementation of both fully online and blended approaches in teaching and learning, identifying that “e-Learning has the potential to transform the way we learn. It's about exploiting technologies and using ICT effectively across the curriculum to connect schools and communities and to support evidence-based decision making and practices in schools” (Ministry of Education, 2006, p. 3).

In 2011, the *Enabling e-Learning* website was launched by the Ministry of Education, aiming to provide an “online ‘hub’ for ICT-related education resources and programmes in New Zealand, bringing together everything that school leaders and teachers need to improve their e-learning practice” (Ministry of Education, 2012).

In this context, online education with blended teaching and learning is developing in New Zealand schools, consisting of two main types that involve either *blended distance* or *blended web-enhanced* courses (see *Glossary*). With regard to blended distance teaching and learning, hundreds of students are currently enrolled in virtual classrooms, managed by the VLN that has, since 2002, joined e-Learning clusters of schools across the country providing students with the opportunity to enrol in blended distance courses. Students can enrol in these courses in addition to the face-to-face courses that their schools offer, which often combine one hour of video conference with their eTeacher and

self-study at the school with the support of an onsite facilitator, often called the eDean (see *Glossary*). In 2011 the VLN connected around 260 schools from 18 regional clusters and offered more than 160 courses, as well as professional and organizational development (Bolstad & Lin, 2009; Barbour et al., 2011). It is expected that, although the VLN is mostly represented by rural schools, in the future more urban schools will be involved (Roberts, 2009).

Blended web-enhanced teaching and learning is also growing in New Zealand schools, where teachers implement online tools in their face-to-face courses (Roberts, 2009). CantaTech (now CantaNET), which was the first rural e-Learning cluster in New Zealand, is currently involved in expanding blended teaching and learning in the form of blended web-enhanced courses across two e-Learning clusters that include around thirty schools in the South Canterbury district (Davis, 2010). Teachers in the involved schools are provided with opportunities to work individually and collaboratively with other teachers from other schools, developing their skills and knowledge on blended teaching and sharing their experiences using blended approaches in their classrooms (Parkes et al., 2011) (see also Smith, Storr & Sudlow, 2010).

In general, teacher professional development to better implement these blended approaches is often enhanced through schools' involvement in the e-Learning clusters, where they share educational experiences, while increased collaboration between teachers from various areas is one of the most important outcomes for many participating schools (Browning, 2005). In 2011, aiming to provide guidance for cluster schools, the New Zealand Ministry of Education published the revised edition of the *Learning Communities Online Handbook*, informing organizational development for organizations or individuals who choose "to operate as a collaborative network, utilizing electronic and face-to-face mediums, in order to enhance the learning outcomes and opportunities for students, their whānau and educators" (Ministry of Education, 2011, p.1). That handbook has been recently revised to broaden the scope of the initial versions, acknowledging that education needs to move from connected towards networked learning.

2.2.2. Research on online/blended school education

The growth of online/blended school education attracted and continues to attract the interest of many researchers across the world, providing evidence-based results on the positive outcomes and challenges. However, the body of the literature on blended school education is weak, compared to research on fully online taught courses (Horn & Staker, 2011; Cavanaugh, 2009). In addition, given the disparity between the amount of research on adult learners and school students – with more researchers focusing on post-secondary contexts (Means et al., 2009) – further research on blended teaching and learning for school students is needed to inform professional and organizational development in this sector.

In this section, literature of online/blended school education is reviewed. A variety of research papers were selected, based on the focus of the articles (fully online or blended teaching and learning), the context (school education across the world and in New Zealand) the type of publication (empirical studies were preferred, but the review also includes some key literature reviews and position papers) and the time of publication (articles between 2000-2011). The majority of the articles were selected after an online database search, using several keywords such as “online teaching/learning/education”, “blended/hybrid teaching/learning/education”, “web based/enhanced teaching/learning/education”, “e-Learning”. A sample of the key literature used in this section is summarized in *Appendix 1*.

Positive outcomes

Many scholars provide particular examples in discussing the advantages of online/blended approaches, which are often observed in educational practice in schools. Some of the key positive outcomes include:

a. Increased flexibility

Increased flexibility is one of the advantages identified in online education, including the use of blended approaches. For example, Pratt and Trewern (2011a), after interviewing students who had the opportunity to enrol in both face-to-face courses, as well as courses using different formats (including blended distance courses through the VLN), found that flexibility was an important benefit for students, who were learning from multiple providers, in addition to their school. Pratt & Trewern (2011a) conclude that students have valuable learning experiences when they are provided more options for flexible and personalized learning, they develop additional skills and widen their knowledge.

Similarly, Oblender (2002), discussing issues of student retention in virtual schools, argues that with online/blended teaching and learning flexibility is enhanced for both teachers and students, as with the extension of instructional time students' learning experiences can be expanded outside their classroom. Also, in their small case study Parkes et al. (2011) described how one teacher implemented her first blended course in her senior Home Economics class to address timetabling issues, as well as how the class's online learning environment provided extended learning opportunities to the students.

b. Increased student engagement and motivation

Barbour and Reeves (2009), reviewed research on North American virtual schools and summarized some of the advantages of online learning, which, amongst others, also include enhancement of student motivation. Other studies on online/blended school education show that student engagement and motivation can be enhanced for a variety of reasons. Based on observations and informal interviews with Year 7 students who used a variety of web resources in their face-to-face class to

enhance their Science learning, Ng (2008) found that students enjoyed working on the computers in their class and the interactivity of web-resources and self-paced learning were amongst the most important factors that increased student engagement. Wang and Reeves (2006), from observations, student and teacher interviews and a student questionnaire, found that student motivation can be increased when online learning environments include reasonably challenging activities, enable learner control and stimulate student curiosity and fantasy.

c. Development of students' independent learning skills

Online/blended learning can also increase students' independent learning skills, as they engage in self-directed learning. Researching secondary students' experiences with courses through the VLN and based on interviews with eTeachers and students, Bolstad and Lin (2009) found that students' development of independent learning skills was an important advantage for them. Similarly, in their small case study of the first blended web-enhanced course in a New Zealand high school, Parkes et al. (2011), after observing the course's online and face-to-face learning environment, as well as interviewing the teacher and some of the students, found that with the onsite and online support and facilitation of their teacher/facilitator, the students were progressively developing independent learning skills, self management and higher order thinking skills.

d. Development of students' ICT skills

Further benefits of online/blended approaches include students' development of ICT skills. For example O'Dwyer, Carey and Kleinman (2007) used a survey to compare student confidence to use ICT in an online and a face-to-face Algebra classroom. They found that the students who learned online, with the onsite support of a teacher, in addition to their online teacher, were more confident to use ICT after the end of their course, compared to the students in the face-to-face class. Similarly, Tunison and Noonan (2001), researched students' first online course experience and, more recently, Parkes et al. (2011), focused on students' experiences within their first blended web-enhanced course. They found that online learning was a challenging experience for the students. However, in both studies, students' development of ICT skills was one of the most important advantages, which often resulted in enhancing their confidence as well (Tunison & Noonan, 2001; Parkes et al., 2011).

Challenges

Throughout the literature, there are also several reported challenges, often referring to student readiness, teacher commitment and leadership support:

a. Student readiness

Research shows that although some students use technology tools frequently in their everyday life, they still lack the skills needed to use ICT in educationally focused ways, to develop higher order

thinking skills (Wright, 2010). For example, Luckin et al. (2009), in their large scale study on UK secondary school student practices and perceptions with regard to Web2.0 tools, found that although students had high levels of access to Web2.0 technologies, most of them did not have the skills that would enable them to use them educationally. The authors underline the importance of the role of the teacher in facilitating this development.

With regard to online/blended learning in particular, on one hand, when students are given the opportunity to self-direct their learning they become more responsible, motivated and engaged, as Wang and Reeves (2006) observed in their study with secondary school students in a private school. However, on the other hand, remaining engaged throughout their learning is one of the main challenges students face, which often leads to high drop-out rates in fully online taught courses (Irvin, Hannum, Lei & Farmer, 2008; Oblender, 2002; Tunison & Noonan, 2001). For example, Bolstad and Lin (2009) found, based on their observations, as well as teacher and student interviews, that although online learning helped students to become more independent, students' existing self-directed learning skills enhanced their success in courses offered through the VLN. Similarly, when researching secondary students' first experience with online learning, Tunison and Noonan (2001) found that, although students reported in the survey tool that they enjoyed learning independently, one of the most important challenges for them was their ability to self-direct their learning.

Research indicates that appropriate levels of support from the school to the students, depending on students' individual differences, are necessary when learning online (Pullar & Brennan, 2008; Pratt & Trewern, 2011a). For school students, the role of an onsite facilitator is crucial in helping them to remain engaged throughout their online course duration and progressively develop self-directed learning skills (Davis & Niederhauser, 2007; Harms, Niederhauser, Davis, Roblyer & Gilbert, 2010). According to Davis & Niederhauser (2007) the facilitator's role, which is often underestimated, is very important in advising students and helping them to focus on, engage with an commit to their learning, as well as in building a learning community.

In blended distance courses through the VLN in New Zealand, this role is undertaken by the eDean (see *Glossary*). In blended web-enhanced courses the class teacher often takes the role of the onsite facilitator, supervising student learning and providing support (Oblender, 2002), as well as helping learners to familiarize themselves with the challenges of learning in an online environment by gradually exposing them to a more independent style of learning in a controlled and more familiar environment. However, Parkes et al. (2011) point out that although the teacher in their study provided onsite support during one of the two hours of students' online study per week, the students needed more time and support to familiarize themselves with this new independent style of learning. This illustrates further implications for teacher training in order to effectively undertake the role of facilitating, rather than directing student learning.

This observed challenge of student inability to self-direct their learning leads many policy makers and educators towards the argument that blended web-enhanced learning where students have the onsite support of their teacher at all times, is more suitable for school students, compared to fully online taught courses (Chandra & Fisher, 2009; Doering & Veletsianos, 2008; Frailich, Kesner & Hofstein, 2007; Parkes et al., 2011).

What is also evident from other research is that students often face difficulties in engaging in online communication and collaboration with their teacher and classmates (Bolstad & Lin, 2009; Pratt & Trewern, 2011b). In particular, Bolstad and Lin (2009) found that interactions in the online environment of courses offered through the VLN are often influenced by social factors, such as students' relationships with their teacher and classmates. These relationships are often developed during face-to-face interactions, indicating that when students have the chance to physically interact with one another they can become more confident to communicate and collaborate online.

Research confirms that students have less difficulty in communicating and collaborating online when they interact both online and face-to-face with their teacher and classmates (O'Dwyer et al., 2007; Parkes et al., 2011). O'Dwyer et al. (2007) indicate that the opportunity students had to interact face-to-face with one another may have helped them to develop their social presence, as they spent a lot of time communicating and collaborating to talk about their online course and to socialize.

Other studies have shown that in blended-web enhanced courses most students often prefer to interact face-to-face with their teacher and classmates, compared to communicating with them online (e.g. Chandra & Fisher, 2009). Often, the teacher's guidance and support leads to more signs of improvement in this area (Parkes et al., 2011), but it is important for the teacher to be adequately trained in order to effectively encourage and familiarize students with online dialogue. Apparently, the teacher's role is very important in fostering a friendly online and face-to-face environment where relationship development, communication and collaboration are effectively encouraged (Bolstad & Lin, 2009; Parkes et al., 2011; Hughes, McLeod, Brown, Maeda & Choi, 2007).

b. Teacher commitment

Among the most important challenges that teachers face when they use online/blended teaching approaches, is their ability to manage their increased workload demands and be able to *walk the extra mile*, in order to effectively undertake their new role and provide their students with meaningful and effective learning experiences (Lee, 2006; Mupinga, 2005). This is even more difficult for teachers with no previous online/blended teaching experience and related knowledge (Parkes et al., 2011; Lee, 2006). In fact, in their study on teacher-student-external expert collaboration to design an online course, Dewstow and Wright (2005) found that the teacher's familiarity with some aspects of the online learning environment was important for effective use and implementation in the class, whereas

unfamiliarity with some other aspects was a major challenge. Similar challenges emerge when teachers are implementing ICT in other ways in their classes, mainly because of their lack of previous experience with technology tools, which often makes them feel intimidated (Ladbrook, 2008).

According to Frailich et al. (2007), who based their conclusions in a comparative study where they researched student perceptions, attitudes and achievements in a web-based and a traditional chemistry class, "...the success in integrating web-based learning is very much dependent on the teachers. The professional development of teachers and the support given to them is crucial when implementing such a new learning environment" (p.194).

In her research on school cultural change with online teaching and learning, Lee (2006) found that the opportunity primary teachers had to participate in professional development programmes, enabled them to more easily design and implement online content in their classes that met their needs and working styles.

c. Leadership support

The effective implementation of online/blended teaching and learning requires a shift in the whole school culture (Lee, 2006), while the role of leadership in supporting the teachers to effectively undertake their new role is essential (Davis, 2008; Di Pietro, Ferdig, Black & Preston, 2008). Lee (2006) concludes that teachers implementing new approaches such as online/blended teaching and learning "need to be supported, actively and visibly, so that as individual change agents they are allowed to flourish rather than be subdued through closed management structures or an apparent lack of interest" (p.103).

However, the challenges observed in the literature related to inadequate support are not surprising, given the fact that school leaders' experience in online/blended teaching and learning is often limited (Davis, 2008). These challenges referring to limited school support indicate the additional barriers placed for teachers and students. For example, Parkes et al. (2011) found that the effective implementation of the first blended course in a New Zealand high school was negatively influenced by the school leadership's attitudes, affecting decisions regarding the infrastructure. The teacher and the students reported during their interviews that the school's slow computers were inconvenient and at times this increased students' level of distraction. Limited access to computers and internet, either at school or at home, is an important issue that is often identified in the literature on online/blended teaching and learning in New Zealand and elsewhere (e.g. Parkes et al., 2011; Pratt & Trewern, 2011a; Cavanaugh et al., 2009). Referring to students enrolled in courses offered through virtual schools and using a student survey in conjunction with students' post-course evaluations, Roblyer and Marshall (2002/2003) argued that better-than average-access to technology is an important factor that will determine student success in online learning.

What Lee (2006) found during her study on school cultural change with online education, by comparing findings from two different schools, was that teachers needed leadership support to manage workload issues and encouragement to effectively undertake their new role. Challenges related to leadership support were also reported from teachers of courses through the New Zealand VLN. Stevens (2011), researching the distribution of instructional leadership in New Zealand e-Learning clusters, found a range of views on the effectiveness of professional development provided to eTeachers. Professional development was “primarily collegial, informal and sporadic, rather than well-planned and well-aligned to their professional learning needs, goals and appraisals” (p.107), while there was no formal school or e-Learning cluster feedback and support provided to the teachers who taught virtually, indicating further implications for e-Learning cluster leaders (ePrincipals).

2.2.3. Educational change with ICT and blended teaching and learning

Despite the challenges, the positive outcomes of implementing online/blended teaching and learning encourage schools across the world to continue to experiment with these approaches, making their own choices as to the adoption or not of online/blended education. For school students, blended learning with blended web-enhanced courses is often seen as a more realistic solution, given the enhanced opportunities for support and face-to-face interactions with the teacher and other students (Frailich et al., 2007; Doering & Veletsianos, 2008).

In New Zealand in particular, blended school education either in the form of blended distance courses through the VLN or in the form of blended web-enhanced teaching and learning is expected to expand (Browning, 2005). The spread of a small population over a large geographical area, with many schools positioned in rural areas, increase the need for equitable access and flexible learning opportunities (Parkes et al., 2011). In addition, major disruptions, (e.g. the 2010-2011 earthquakes in Canterbury and heavy snowfalls across New Zealand during the 2011 winter), have also illustrated the relevance for schools to consider blended learning, in order to increase their resilience (Davis, 2011b). The current UFBiS government policy is expected to increase equitable access to learning for all students, as well as to further encourage the implementation of blended teaching and learning in schools across the country.

However, the adoption of blended teaching and learning is not a simple process. Davis (2008) argues that the implementation of new technologies at schools is complex, especially when aiming for educational change, rather than to supplement traditional practices. Research scholars argue that the widespread use of ICT in general across schools continues to support traditional practices and therefore does not lead to substantial changes in teaching and learning (Gilbert, 2005; Zhao & Frank, 2003). As Bolstad et al. (2006) argue, ICT in education can support pedagogical change, but technology implementation by itself is not enough to lead to educational reform. The potential of ICT to transform education, to promote the development of 21st century skills and to prepare students for

the Knowledge Society, not only requires a pedagogical shift on the part of the teachers (Gilbert, 2005; Andreotti & Souza, 2008), but also, as Lee (2006) argues, a change in the whole school culture is necessary.

According to Rogers' (2003) theory on the diffusion of innovations and their rate of adoption, the adoption of an innovation (e.g. blended teaching and learning) depends on individuals' perceptions of some of the innovation's attributes. These attributes are:

- a. Relative advantage: "the degree to which an innovation is perceived as being better than the idea it supersedes" (p.229).
- b. Compatibility: "the degree to which an innovation is perceived as consistent with the existing values, past experiences and needs of the potential adopters" (p.240).
- c. Complexity: "the degree to which an innovation is perceived as relatively difficult to understand and use" (p.257).
- d. Trialability: "the degree to which an innovation may be experimented with on a limited basis" (p.258).
- e. Observability: "the degree to which the results of an innovation are visible to others" (p.258).

In a class context where blended teaching and learning is likely to be adopted, individuals whose perceptions will have an impact consist of the class teacher and the student. In addition, other individuals within the school also have a key role in the development of blended teaching and learning, including school leaders and other staff members, whose support is necessary.

When researching educational reform with ICT, including change with blended approaches, an ecological perspective is useful. In this perspective, "a classroom is nested within a multilevel ecological hierarchy including government agencies, societal institutions, local community organizations and the school bureaucracy" (Zhao & Frank, 2003, p. 815). Davis (2008, in press) presented an *arena of change*, to illustrate the interconnectedness of schools with multiple organizations and their impact on the change process. These organizations are professional, bureaucratic, political and commercial (also including OER) organizations, as illustrated in *Figure 1*.

The arena clarifies the complexity of educational reform, showing the many varieties of stakeholders who can stimulate or retard change with digital technologies. These stakeholders are not limited to teachers and/or school leaders. Although teachers "are the keystone species in the educational ecologies of the twenty-first century world" (Davis, 2008, p. 517), the whole school ecology is also impacted by a range of external organizations presented in the arena. These external organizations may need to reconsider their vision of knowledge, in order to facilitate change with ICT in 21st century schooling.

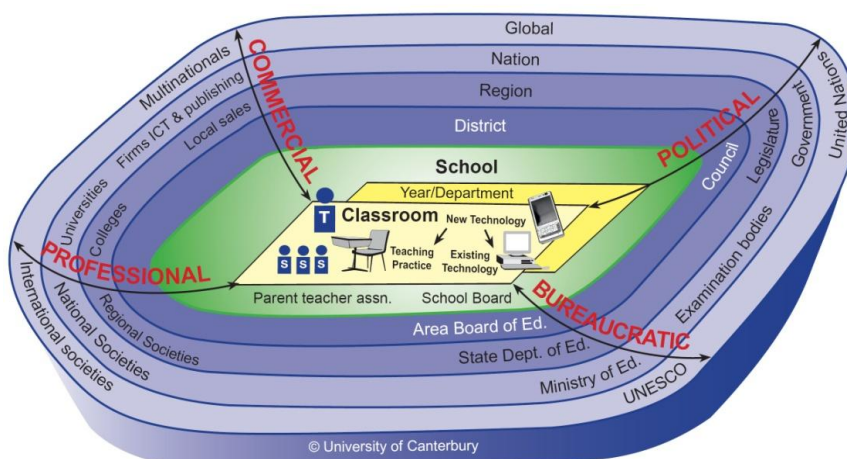


Figure 1. The arena as a metaphor of educational change with ICT (Davis, 2008, in press)

Linking back to Rogers' (2003) theory on the diffusion of innovations, the impact of other organizations (commercial/OER, bureaucratic, political, professional) that can simulate or retard change should also be considered (Davis, 2008, in press) when assessing the rate of adoption of blended approaches. In addition, these organizations include many individuals whose perceptions of blended approaches will also determine the support and encouragement they will provide to teachers and schools. For example, professional organizations, such as those in ICT PD clusters and VLN, have clearly reshaped the educational landscape in New Zealand by encouraging the use of ICT and blended learning in schools and by providing professional development to teachers. Commercial organizations and OER increase the availability of online tools and digital technologies, to provide more educational opportunities and also impact on teachers' and school leaders' attitudes towards the use of blended teaching and learning in the classroom. Bureaucratic organizations such as the Ministry of Education, promote initiatives (e.g. the *TELA programme*, the *e-Learning Action Plan for Schools 2006-2010* and *ICT PD initiative*) and support the adoption of blended teaching and learning. Political organizations, such as the current government with its UFBiS action plan, can further stimulate the adoption of blended teaching and learning.

Considering the important roles of all these stakeholders and their organizations, the change process appears to be complex, as different individuals have different roles, needs and consequently different perceptions of the attributes of blended teaching and learning. Peter Senge (cited in Smith, 2001) argues the importance of building a shared vision, in order to enhance individuals' commitment, rather than compliance with an innovation or innovative practice, and allow them to work productively towards achieving common goals. A shared vision would also enable individuals from a learning organization, such as a school, along with people from other organizations that interact with schools to have a similar reference point with regard to the attributes of blended teaching and learning.

2.3. Implications for research

With the growth of blended teaching and learning in New Zealand and internationally and the limited body of the literature on blended school education, the need for further research on the use of these approaches in school contexts becomes more apparent (Horn & Staker, 2011; Cavanaugh, 2009). The need becomes even greater in New Zealand, at a time when more and more schools are stimulated to engage with blended teaching and learning, either by offering to students blended distance courses through the VLN, or by teachers' experimentation and/or adoption of blended web-enhanced teaching. Schools' involvement with blended approaches is expected to further grow with the government's UFBiS initiative.

The studies informing this literature review often research students' and teachers' perceptions of online and blended teaching and learning approaches, in order to inform professional and organizational development. However, few of these studies researched the implementation of online or blended teaching and learning from a wider perspective, including more key stakeholders' (e.g. school leaders) perceptions and experiences. Davis's (2008, in press) arena of change can be used to inform the design of this research, by clarifying that a classroom is nested within an ecosystem where multiple stakeholders impact on change with ICT and implying the need to investigate not only teachers' and students' perceptions, but also other key stakeholders' role in blended school education. Therefore, this study will be the first to set a case study of a school within Davis's (2008) arena of change with digital technologies in education.

Chapter 3: Methodology

Introduction

This chapter provides a description of the case study design (a main case of one rural secondary school, including an embedded case of one blended class). An overview of the participants and setting, data collection methods and analysis, discussion on the validity, reliability and the ethical considerations of the research are also provided.

3.1. Qualitative research – Case study

This study aims to investigate the implementation of blended teaching and learning in a New Zealand secondary school. It will provide a deeper understanding of the practices that are undertaken to facilitate the process, the positive outcomes and challenges that emerge and the school leaders', teachers' and students' experiences. The focus is on the implementation of blended teaching and learning as an innovation in the whole school, also providing greater detail of the use of blended approaches within one particular class.

A qualitative research approach is selected for this study. According to Johnson and Onwuegbuzie (2004), qualitative research is interested in complex phenomena. Qualitative methods can “explain the psychological dimensions of human beings which are impossible to represent numerically in a quantitative way” (Hara, 1995, p.353). In this research, investigating individuals' experiences and perspectives on the implementation and use of blended teaching and learning is a complex process, as experiences and perspectives have multiple dimensions that cannot be fully represented quantitatively. Qualitative methods can approach individual perspectives and experiences in more depth.

In qualitative research, the researcher often comes across questions during the study, rather than just at the beginning. Being flexible and adaptive (Bamberger, 2000) the qualitative researcher has the opportunity to refocus during research, as several issues might emerge (Teddle & Tashakkori, 2009). Its descriptive character stems from “the goal of exploring the attributes of a phenomenon or the possible relationships between variables” (Teddle & Tashakkori, 2009, p.23), while “theory developed emerges from the bottom up, from many disparate pieces of collected evidence that are interconnected” (Bogdan & Biklen, 1992, p.32). In this research, the aim is to understand in depth how blended teaching and learning is implemented, as well as a range of individual perspectives, rather than to test a hypothesis. Given the exploratory nature of the topic, questions and possible relationships between data can occur during the research process.

Informed by the case study designs described by Yin (1994), this single case researches blended teaching and learning at one school, selected as being one of the early adopters in terms of blended

approaches. Within this single case, there is also an embedded case of a class where blended teaching and learning was used, as illustrated in *Figure 2*.

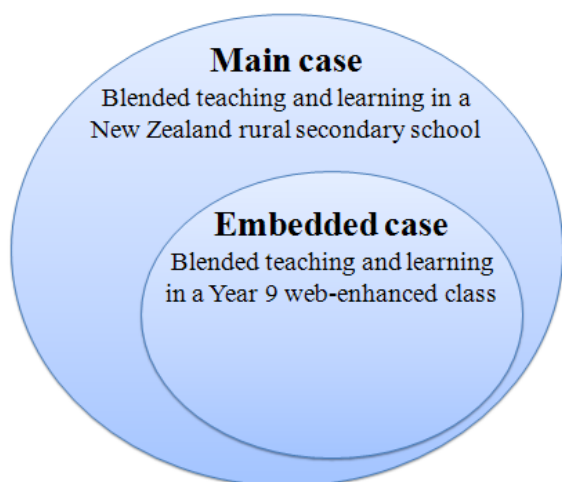


Figure 2. The design of the main case study with the embedded case

According to Stake (2003), a case study is “of value for refining theory and suggesting complexities for further investigation, as well as helping to establish the limits of generalizability” (p. 156). This research does not aim to generalize the findings. It can be characterized as an intrinsic case study (Stake, 2003), as it is interested in the case of the specific school, not because of its representativeness of other schools, but in particular because it was one of the early adopter schools in terms of blended teaching and learning (see *Methodology/Participants and setting*).

3.1.1. Pilot study

A pilot study was carried out, in order to inform the design of this research. Pilot studies provide in advance evidence on potential challenges during the research process and the researcher can also test the appropriateness of the data collection methods (Teijlingen & Hundley, 2002).

The pilot study was carried out in an urban high school in New Zealand (Decile 3), with students from a variety of cultural backgrounds (European, Māori, Pasifika, Asian). A case study methodology was followed, as the research aimed to understand in depth how the first blended course (NCEA Level 2 Home Economics) was implemented in a New Zealand high school, by a teacher with experience in her field, but with no previous experience in using blended teaching approaches. Researching the teacher's and the students' perspectives was also one of the main aims of this pilot study. The pilot study (Parkes et al., 2011) linked to a postgraduate course in collaboration with the class teacher and had the following research questions:

1. In what ways is the online content blended into the Home Economics course?

2. What are the positive outcomes and the challenges occurring throughout the implementation of the blended online course?
3. How can the outcomes of this study inform and be informed by the literature on effective practices to implement blended online learning in secondary school settings?

To gather the teacher's and students' perspectives on their blended teaching and learning experiences, observations of the online and face-to-face learning environment were conducted, in conjunction with interviews with the teacher and group interviews with selected students. The findings of this pilot study provided an understanding of the positive outcomes and challenges that emerge when implementing a blended course for the first time and identified the complexity of the implementation of ICT related innovations in schools.

Positive outcomes included the provision of flexible and extended learning opportunities to the students, development of student confidence and ICT related skills, encouragement of face-to-face and online interactions, self-directed learning opportunities, development of self-management and higher order thinking skills, provision of various resources and opportunities for authentic learning, as well as for the professional growth of the teacher. The challenges were related to student readiness to learn online, the teacher's lack of previous blended online teaching experience, as well as limited school support and provision of adequate infrastructure.

These findings, triangulated with the current relevant literature, facilitated the development of some recommendations for schools considering incorporating blended teaching and learning approaches and raised discussion points on effective blended school education. The recommendations include: planning for ongoing review of students' characteristics and skills, designing for concise online course structure, expectations and objectives, providing onsite support, facilitation and face-to-face interaction opportunities to the students, and finally ensuring teacher commitment and engagement in professional development, as well as school support and adequate infrastructure (Parkes et al., 2011).

The ways in which the outcomes of this pilot study informed the design of this research will be explained in the following sections, where applicable.

3.2. Participants and setting

The setting of this case study consists of a high decile rural secondary school (Years 7-13), positioned in a small town, at the centre of a large agricultural district. The school's proximity to one of the biggest cities of New Zealand makes it a special case of a rural school. It is the only secondary school in the area, serving students from the town and surrounding areas. The majority of students are New Zealand European and there is also a small percentage of Māori, Asian and students from other ethnic groups.

The school was one of the early adopters of blended approaches, in the form of blended web-enhanced courses and in the form of blended distance courses through the VLN. At the time of the research in 2011, the school was also a member of a rural e-Learning cluster, a regional ICT PD cluster providing professional development to teachers specifically on blended teaching and learning since 2010, and a contributing schools' ICT PD cluster.

Access to the school and the participants was negotiated with the school principal, the ePrincipal of the school's e-Learning cluster and one of the teachers after a visit by the researcher and the research supervisor to the school in April 2011. At that time oral permission from the school principal, the class teacher and the ePrincipal was obtained.

Researching the implementation of blended teaching and learning at the whole school in general, the study investigates teachers' perspectives and practices with blended approaches. Teacher participants were selectively recruited after the school principal's recommendation, based on his perception of teachers' use of blended approaches.

The findings from the pilot study had confirmed the impact of leadership support for the effective implementation of blended teaching and learning, indicating the need to investigate school leaders' perspectives and experiences in addition to those of teachers, in order to have a more complete understanding of the use of blended teaching and learning in schools. This is of particular importance, given the incompatibility that was found in the pilot study between the teacher's and school leaders' views on the perceived advantages of blended teaching and learning, and also considering the importance of having a shared vision in learning organizations, as suggested by Senge (cited in Smith, 2001), in order to stimulate change.

Therefore, in addition to researching teachers' perspectives on blended approaches, this study also sought to investigate school leaders' perspectives and experiences. In addition the study researches the practices undertaken in one particular classroom (the embedded case – a Year 9 blended web-enhanced class) and the perceptions and experiences of the class teacher (Teacher 6) and six students from the class who volunteered to participate, in order to increase the depth of the investigation. Teacher 6 was one of the early adopters of blended approaches in the school, but in this Year 9 class, he has been implementing blended-web enhanced teaching and learning for the first time with these students. The teacher, who was also teaching Science, used one of the four Science teaching periods to engage his Year 9 form class in blended learning as a form class activity, but also as part of their Science learning.

Table 2 provides a brief overview of the participants, including the ePrincipal of the e-Learning cluster, the school principal, six teachers and six students. The number of participants for this case

study can be considered satisfactory, given the fact that it is a qualitative study that is more interested in depth, rather than breadth of data (Tolich & Davidson, 1999).

Main case – the school	
ePrincipal	The ePrincipal of the school's e-Learning cluster had been in his position since 2008 and he was also a based at this school as a teacher, teaching through the VLN. As a teacher, he was one of the early adopters of online teaching approaches since the beginning of his career. From his position as the ePrincipal of the school's e-Learning cluster, he has been a strong supporter of blended approaches and networked learning, which he has had the opportunity to further support through the development of a regional ICT PD cluster and its Blended Teaching and Learning Professional Development (BTLPD) project.
School principal	The school principal had been in his position since 2009. As a leader in the school he encouraged teacher experimentation with a variety of online tools, acknowledging the potential of blended approaches to enhance the school's vision for engaged and independent student learning. He was also a member of the rural e-Learning cluster committee.
Teacher 1	Blended distance course eTeacher teaching Level 3 Physics through the VLN. He was the school eDean for the students enrolled in other blended distance courses.
Teacher 2	Blended distance course eTeacher and blended web-enhanced course teacher. The year of the study was her second year teaching a blended distance course for Year 11 French language.
Teacher 3	Face-to-face course teacher, who was planning to implement a blended web-enhanced course the following year for the first time in his senior Technology class.
Teacher 4	Blended web-enhanced course teacher experimenting with a variety of online tools in her Year 8 class, including ePortfolios, which she implemented for the first time in the year of the study.
Teacher 5	Blended web-enhanced course teacher, implementing a variety of online tools in her Year 7 face-to-face class. For this teacher, this was the third year of implementing blended approaches with her students, experimenting with a variety of tools.
Embedded case – the Year 9 class	
Teacher 6	Blended web-enhanced course teacher, using a variety of online tools to enhance face-to-face teaching and learning in his Year 9 form and Science class. He was one

	of the early adopters of blended teaching and is currently involved in the BTLPD, offered by the regional ICT PD cluster.
Students 1, 2, 3, 4, 5 and 6	Six students from the blended web-enhanced Year 9 class. Most of them enjoyed Science as a subject, because of the hands on activities, experiments and development of ICT skills it involved. They all had access to computers and internet from home, sharing a family computer, which they mainly used for social networking with friends, entertainment and homework. The students of mixed abilities and skills have used other online tools in other subjects, such as wikis and for them the Year 9 blended web-enhanced form and Science class was the first class where they systematically used ePortfolios.

Table 1. Overview of study participants and their roles

3.3. Data collection methods

Bogdan and Biklen (1992) emphasize the importance of rich descriptive data in qualitative research, in order to understand and better explain reality. Being a case study, this research includes a variety of data collection methods (Cohen, et al., 2007). *Figure 3* provides an overview of the data collection methods, based on the case study design, including the main and embedded cases. *Table 3* summarizes the different types of data sources used in this study.

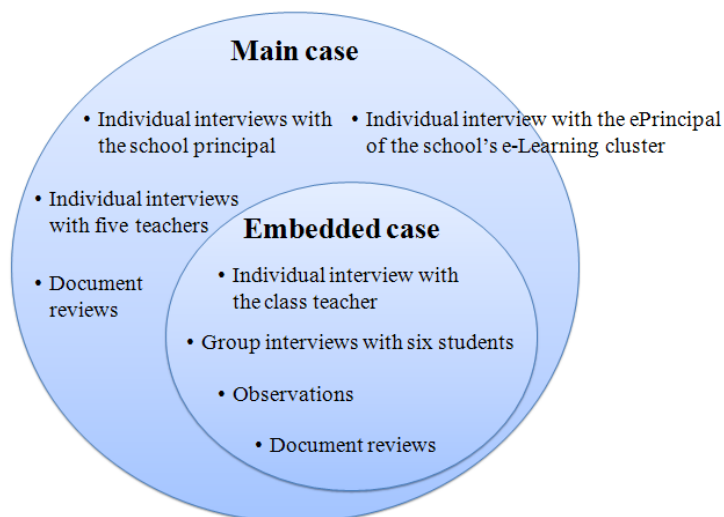


Figure 3. Overview of data collection methods

Type(s) of data				Focus on blended distance teaching and learning	Focus on blended web- enhanced teaching and learning
Interviews	Participant	Number of interviews	Interview time (on average)		
	ePrincipal	1	40 minutes October 2011	✓	✓
	School principal	2	25 minutes May 2011 35 minutes December 2011		✓
	Teacher 1 (eDean)	1	25 minutes September 2011	✓	
	Teacher 2	1	35 minutes October 2011	✓	✓
	Teacher 3	1	30 minutes September 2011		✓
	Teacher 4	1	20 minutes September 2011		✓
	Teacher 5	1	40 minutes September 2011		✓
	Teacher 6	1	40 minutes September 2011		✓
	Students 1, 2 and 3	1 (group)	30 minutes September 2011		✓
	Students 4, 5 and 6	1 (group)	30 minutes October 2011		✓
Observations	Setting	Number of observations	Frequency		✓
	Year 9 face- to-face class	8	1/week August 2011 – September 2011		✓
	Year 9 class's online learning environment	8	1/week August 2011 – September 2011		✓

	on VLN portfolio and Moodle				
Document reviewing	Key resource reviewed	Access period			
	e-Learning cluster's website	April 2011 – April 2012		✓	✓
	BTLPD website	April 2011 – April 2012			✓
	School website	April 2011 – April 2012 (General information about the school and its policies)		✓	✓
	Teacher 6's VLN portfolio journal	June 2011 – December 2011			✓
	Student participants' VLN portfolio pages	June 2011 – December 2011			✓

Table 2. Summary of data sources, indicating the volume and focus of the data

3.3.1. Interviews

During the pilot study, the interviews were designed to elicit participants' perspectives on blended teaching and learning, providing access to information that could not be observed. Wellington (2000) argues that interviews enable access to information that other methods cannot provide, such as experiences and attitudes, that can neither be observed, nor measured comprehensively through questionnaires. In addition, the participants are encouraged to provide their own interpretations of the reality, so interviewing is a powerful method of collecting data for complex and deep issues (Cohen et al., 2007).

For all participants, except the students, the researcher carried out individual interviews, using this method as a primary source of data. For student participants the interviews were carried out in groups, as interviewing students in small groups during the pilot study (2 students per group), enhanced their confidence in sharing their experiences and generating more opinions, as they were encouraged by each other's presence. According to Lederman (1990) the group provides a safe environment to cooperate and generate more ideas than one participant could generate on their own. For school students in particular, being interviewed in a group might be less intimidating than individual interviews (Cohen et al., 2007).

A semi-structured interview format was used, as the questions followed a given agenda, but they were open-ended, allowing for controlled flexibility (Cohen et al., 2007). The use of more open questions also enhances participants' ability to express their own opinions, without being directed, while they provide answers that cannot always be predicted before the interview (Tolich & Davidson, 1999). The findings from the pilot study and key themes from the literature review also provided a framework for the prompts that were used to elicit further views from the interviewed participants (e.g. student ability to self-direct their learning, teacher workload issues, leadership support, access to sufficient infrastructure etc). A full list of the interview questions for all participants is included in *Appendix 2*.

a. Individual interview with the ePrincipal of the school's e-Learning cluster

The ePrincipal was interviewed at the end of Term 3 to gain his perspectives on blended teaching and learning at the school's e-Learning and regional ICT PD cluster, with particular focus on this school. The interview questions focused on issues such as the ePrincipal's perceptions of the use of blended teaching and learning at the school and in other schools across the clusters, the support mechanisms that were in place, the advantages and challenges observed and/or experienced and his perspectives on other impacting factors.

b. Individual interview with the school principal

The school principal was interviewed in Term 2 on his experience of implementing blended teaching and learning at the school, the available support to teachers, the current state of use, the observed benefits and challenges regarding blended approaches at the school and other related aspects. This interview was carried out before the data collection period of this research, as part of a postgraduate class project. Rogers' (2003) theory of the diffusion of innovations was used to structure some of the interview questions, in order to investigate the principal's perceptions of the attributes of blended teaching and learning at the school and understand the rate of adoption from his point of view. The school principal gave permission to use the transcript of this previously carried out interview for this research as well, while he gave his consent to carry out a second interview at the end of Term 4, in order to discuss his views on the emerging themes after early interpretation of the findings.

c. Individual interview with six teachers from the school

Six teachers from the school were interviewed once individually at the end of Term 3, focusing on aspects such as their experience of the implementation of blended teaching and learning at their school and classes, their practices and perceptions of the advantages and challenges of blended approaches, the support provided and needed. For Teacher 6, whose Year 9 class was observed, more specific prompts were used, based on data from the class's observations.

d. Group interviews with six students of the observed class

Six students from the Year 9 class volunteered to be interviewed in two groups of three participants at the end of Term 3. The interview focused on aspects such as their blended learning experiences in the particular class, the benefits and challenges they identified, the aspects they enjoyed more or less and the level of support provided and needed throughout the implementation.

3.3.2. Observations

According to Hatch (2002), the strength of observations lies in the fact that the phenomenon of interest is observed in the setting where it naturally occurs, while the researcher can discover by themselves participants' views and has access to information that is not always mentioned in interviews. In the pilot study, the observations of the blended course's online and face-to-face learning environment provided more objective insights into the participants' experiences, while for the researcher, who was an outsider, this increased understanding of the context of the blended course. This method of data collection also enabled an inductive discovery of students' experiences, which was particularly important, given their relatively low level of maturity to reflect on their learning during the interviews.

The Year 9 form class was observed, in order to investigate the ways through which blended teaching and learning was implemented. The observations included visits in the face-to-face learning environment once a week for the whole of Term 3 (the teacher used one out of the four Science teaching hours for his form class). The researcher also observed the class's online learning environment (primarily through VLN portfolio by Mahara, and Moodle), in order to better understand the way online content was blended in this class, the teacher's presence and student participation. Field notes were written by the researcher after all observations, that focused on the teacher's implemented practices, his online presence, facilitation, feedback and support, as well as on the students' online and face-to-face presence, participation, peer feedback, interactions and any other aspects related to their blended learning experience.

It should also be noted that the design of the observation schedule was based on the researcher's previous experience as an observer during the pilot study. In cases where observations are included in

the research, the researcher has the opportunity to build up relationships with the participants, and the interview is often like a conversation between friends (Bogdan & Biklen, 1992). Increased familiarity with the researcher was important in enabling students to feel more comfortable with her presence in the class. This was also of particular importance, as it enhanced student comfort during the interviews. During the observations in the Year 9 class for this research, the researcher's role as a non-participant observer was slowly evolving into a participant observer, as the teacher often felt comfortable discussing with the researcher his ideas on implementing blended approaches and asking for feedback. Teacher 6 also often encouraged the researcher to interact with the students, helping them during their learning and providing them with feedback and encouragement on their efforts.

3.3.4. Review of documents/web resources

Bowen (2009) argues that reviewing documents as a source of data (either printed or electronic material) can “provide background and context, additional questions to be asked, supplementary data, a means of tracking change and development, and verification of findings from other data sources” (p.30). Web resources, such as Teacher 6’s online reflection blog on VLN portfolio (used as an online journal to report his professional reflections for the BTLPD), the e-Learning cluster’s website and the school’s web page were used as secondary sources of data and provided additional information to enhance understanding of the context, as well as to supplement and verify some of the findings.

3.4. Data analysis

All interviews were transcribed by the researcher to increase familiarity with the data and to enhance her reflection on the findings. Grounded theory was used to carry out the primary analysis of the data. “Grounded theory is a general methodology for developing theory that is grounded in data systematically gathered and analysed” (Strauss & Corbin, 1990, p.273). The data from the interview transcripts, the observational field notes and notes from the review of documents and websites were analysed using codes and themes, applying continuous interrogation to include alternative interpretations and linkages (Coffey & Atkinson, 1996). The themes emerged inductively according to the data. Boyatzis (1998) argues that this way the researcher’s perception is less likely to interfere with the results, and information in its gross and intricate aspects can be further appreciated.

In particular, at the first level, data were analysed based on the case study design shown in *Figure 1*. The main themes from each case (main and embedded) were analysed according to individual or groups of individuals depending on their role (main case: ePrincipal, school principal, teachers; embedded case: teacher, students). At the second level, the researcher identified key findings from the first level of analysis in each case that were apparent in the themes across individuals or groups of participants. The purpose of this second level of analysis was to highlight some of the main issues that were raised from the participants and to provide a more complete picture that would enable answering

the main research question. This approach which organizes the data analysis based on the research question enables the clear investigation of evidence across participants and instruments, as it

draws together all the relevant data for the exact issue of concern to the researcher, and preserves the coherence of the material. It returns the reader to the driving concerns of the research, thereby ‘closing the loop’ on the research questions that typically were raised in the early part of an inquiry (Cohen et al., 2007, p. 468).

These key themes were used to present the story of the case study, beginning from the context of the school and its rural e-Learning cluster, the school itself and its culture, including teachers’ practices with blended approaches, the observed/experienced advantages and challenges, as reported by the participants.

After the primary analysis, Davis’s (2008, in press) arena of change with digital technologies in education was used for secondary analysis of the data. Embedding findings of the grounded analysis in the arena of change enabled the development of an ecological framework to discuss the blended teaching and learning at the school, which is presented in the *Discussion* chapter.

3.5. Validity and reliability

One of the main principles suggested by Yin (1994) to increase validity and reliability in a case study is using multiple sources of evidence. The range of data collection methods used in this case study as described previously (see *Methodology/Data collection methods*), enabled triangulation of the results by finding consistencies between data from different sources, or by providing explanations for any differences between them (Patton, 2001). According to Yin (1994), the use of multiple sources of data collection is one of the most important characteristics of case studies, and which results in “the development of converging lines of inquiry” (p.92). Therefore, the results of a case study are highly likely to be more convincing and accurate, compared to findings from other studies that are not using a range of data collection methods (Yin, 1994). After the completion of data collection and transcription of the interviews, member checking was also used for all adult participants (interview transcripts were sent to adult participants through individual emails), as suggested by Lincoln and Guba (1985) as a method of further triangulation.

A range of evidence is cited throughout the report of the findings, consisting either of quotes from the participant interviews, excerpts from the observational field notes or review of documents/websites, in order to enhance the reliability of the research. According to Atkinson (cited in Ezzy, 2002) examples from the data bring the readers closer to the described context, which enables them to feel that they are participating in the construction of the text meaning.

Credibility and reliability are also enhanced with the use of grounded theory during data analysis, preventing the researcher's prior conceptions from interfering with the study, allowing the themes to develop inductively from the data. "It is important in case studies for events and situations to be allowed to speak for themselves, rather than to be largely interpreted, evaluated or judged by the researcher" (Cohen et al., 2007. p.182).

In order to further limit the interference of the researcher's own attitudes in the interpretation of the findings, researcher notes after ongoing reflection were kept during the composition of the observational field notes, as well as during the analysis of the data (Bogdan & Biklen, 1992). The researcher, who was slowly becoming more involved in the classroom practice (see *Methodology/Data collection methods/Observations*) also included in the observational field notes a record of her own actions in the class, in order to enhance her reflection on participants' behaviour and experience (Taylor & Bogdan, 1998). The data were interrogated in a way that alternative interpretations and linkages were included, with the aim of presenting the findings in a way which was closest to the reality (Coffey & Atkinson, 1996).

3.6. Ethical considerations

In research that involves human subjects, several ethical issues need to be explored and addressed throughout the research process (Mutch, 2005). For this research data were collected after ethical approval from the University of Canterbury Educational Research Human Ethics Committee on June, 2011. Information letters were given to all the participants, providing details on the purposes, conduct and possible dissemination of the research, in order for them to give their signed consent to participate (see *Appendix 3*).

For the student participants in particular, documents were written in appropriate language for their age (junior high school students) and the researcher also orally informed them on the study in their class at the end of one of their lessons. Information letters and consent forms were also given for their parents to obtain their permission for their child's involvement in the study as participants in group interviews. Additional permission to conduct the research at the school was acquired from the school principal.

Observations of the online and face-to-face learning environment were carried out after informed consent was given by the blended class's teacher and the school principal. The students' consent was not required for that, as the class was observed as a whole, keeping the participants anonymous, without focusing on any specific students. Tolich and Davidson (1999) suggest that in cases in which it is not feasible to have informed consent from the participants (especially during observations in public settings) the researcher can disregard this principle, as long as anonymity for those who are involved is granted.

The ePrincipal, school principal and teachers consented to be interviewed by the researcher. Teacher 6 gave permission to use his online reflection blog on his ePortfolio (as part of his professional development) for additional data as well. The school principal also gave his informed consent to use a transcript from a previously carried out interview with the researcher, as part of a postgraduate course project, as well as to be interviewed for a second time during this research.

Participation was completely voluntary with all participants having the right to withdraw anytime during the research. With the aim of preventing any issues with students' voluntary participation and potential coercion, students' and parents' information letters and consent forms clearly stated that this research had no relation to their course obligations and that their grades would not be affected. Alton-Lee (2001) argues that it is important to invite the researcher to explain the research to the participants and not the teacher, to minimize the effect of the teacher's status on students.

All adult participants were provided with a copy of their interview transcript for review and approval; however, this was not done for the students, given the group format of the interview and issues of confidentiality involved with this form of interviewing. Pseudonyms are used to ensure anonymity for all the participants, including the school and its e-Learning cluster. Having the consent of the participants from the beginning does not give the researcher the right to use all data acquired (Cullen, 2005). Therefore, any information derived from the data that could expose or harm the participants is not included.

Chapter 4: Findings

Introduction

In this chapter, findings from the case study of one rural secondary school in New Zealand (main case) implementing blended teaching and learning (blended distance and blended web-enhanced), with an embedded case of one blended web-enhanced class are presented. The chapter begins with the context of the school, in order to understand the general uptake of blended teaching and learning in schools within the region and the available support from the rural e-Learning cluster and the regional ICT PD cluster. A rich description of the main case of one rural secondary school and its culture is then presented, including the vision encouraged by the school leadership, the general uptake of blended approaches at the school, as well as the available professional development and support to teachers. The evidence from the teacher participants is then presented along with their use of blended teaching and learning in their classes. In order to provide a more detailed description of a blended class, an embedded case of a Year 9 class incorporating blended approaches with blended web-enhanced teaching and learning is also included, to provide detail of one of the teacher's and his students' blended teaching and learning experiences. *Figure 4* provides an overview of the case study design informing the presentation of the findings and includes the school context, the main case of the school and the embedded case of the blended web-enhanced class.

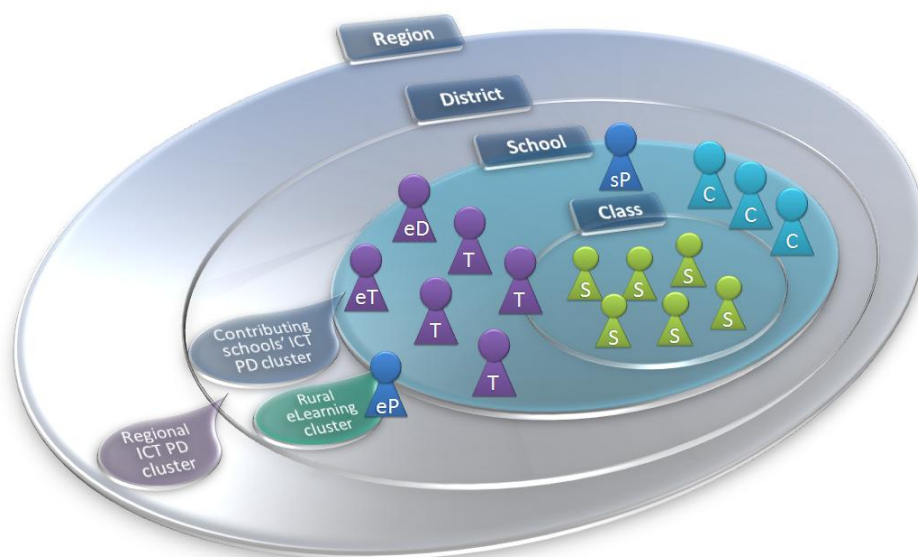


Figure 4. The case study design providing the basis for the presentation of the findings
(S: Student, T: Teacher, eT: eTeacher, eD: eDean, sP: school principal, C: Community/parents)

4.1. The school context

The study took place in 2011, almost one year after the New Zealand government announced its action plan to equip 75% of homes and 97% of schools with UFB by 2016. At the time of the study, this secondary school was a member of a rural e-Learning cluster that had its main focus on providing e-Learning opportunities (through blended distance courses) to students and teachers from its schools (from the e-Learning cluster's website). Teachers were also encouraged to use the cluster's online learning environment (developed on Moodle), as well as an ePortfolio tool (VLN portfolio, which is an implementation of the Mahara software – open source ePortfolios, that was designed in New Zealand (see <http://portfolio.vln.school.nz/>), to enhance their face-to-face courses. Given the need to maintain anonymity for all participants, pseudonyms are used where necessary.

4.1.1. Vision and support from the e-Learning cluster

The ePrincipal (see *Table 2*), who was one of the two rural e-Learning cluster leaders, explained his vision to change school structures and how schools approach teaching and learning. During one of the interviews, he argued that in today's society, there is a greater need to focus on learning that is customized to students' needs, thereby enabling students to take responsibility for and control of their own learning:

“I want to challenge the school structures and change how we approach learning in a school. [...] I think that where we need to focus as much as possible [...] is the idea of giving students control of their learning.” (ePrincipal, interview October 2011)

The ePrincipal also added that school structures would change by enhancing connectivity between schools:

“[We want to] connect those schools and get them to think outside their own little school, thinking of these opportunities that it is not just about your school; that if you can connect across the cluster, there are huge advantages out of it.” (ePrincipal, interview October 2011)

Secondary schools have a greater need for change compared to primary schools, according to the ePrincipal, as this is where teaching and learning are mostly traditional. Referring to the changes that the web has brought to today's society, the ePrincipal talked about the potential of e-Learning, to address the vision for change in school structures, to enable personalization:

“These programmes give students lots of opportunities to diversify, to personalize learning, to have lots of flexibility.” (ePrincipal, interview October 2011)

He further explained the opportunities he saw for blended approaches to increase connectivity, particularly in terms of strengthening home-school, student-teacher connections and also getting schools to collaborate and work together, especially with the use of a shared online environment:

“We want schools to use the cluster environment, because it’s quite a rich environment, it is Open Source and it provides opportunities for collaboration – a real opportunity for innovation.” (ePrincipal, interview, October 2011)

The vision that the ePrincipal talked about was also summarized on the e-Learning cluster’s website, where personalization and collaboration were amongst its priorities, alongside online/blended learning and teacher professional learning (from the e-Learning cluster’s website, accessed March, 2012). The ePrincipal noted that he saw a greater potential for innovation with blended web-enhanced courses, compared to offering fully online taught courses, as students can benefit from both worlds:

“There’s a lot of chance for innovation within and across schools where you are blending and there’s still the face-to-face but you are working online a lot with the students as well, across schools as well.” (ePrincipal, interview October 2011)

Before 2010 the support that the rural e-Learning cluster offered to the member schools was quite limited according to the ePrincipal and often lacking in focus. The ePrincipal noted resourcing as a main challenge and added that support would be more effectively provided if the cluster could have a larger team of people who would work across the cluster on a sustainable basis.

However, ICT PD funding from the Ministry of Education for 2010-2012 was enabling the cluster to adopt a different approach for professional development and support, through the development and coordination of their regional Blended Teaching and Learning Professional Development (BTLPD) project. The e-Learning cluster, through its involvement in the regional ICT PD cluster, collaborated with a New Zealand university to provide a postgraduate course of study on e-Learning to teachers from 30 schools across the regional ICT PD cluster. These teachers (and the ePrincipal) developed their knowledge of and experience with blended teaching and they also shared their expertise with other staff from their own schools. There were also meetings for school principals (from the BTLPD website, April 2011).

4.1.2. Blended teaching and learning across the region

At the time of the study, the uptake of blended approaches across schools in the e-Learning cluster varied. According to the ePrincipal, bigger schools that were well resourced in terms of staff were more likely to consider implementing blended web-enhanced courses. Some schools also offered blended distance courses through VLN; the ePrincipal noted that smaller schools had a greater need for distance courses, owing to staff shortages for specialist subjects. At the time of the study, there

were at least 200 students from all over New Zealand enrolled in VLN courses offered from teachers in this school's e-Learning cluster (from the e-Learning cluster's website, March 2012).

The ePrincipal noted that this school's e-Learning cluster had always had a focus on blended distance courses through the VLN, but during the last few years the cluster has been investigating ways through which e-Learning can impact on students' face-to-face learning, by offering blended web-enhanced courses:

"Now we've started to look at how that can impact on face-to-face teaching as well, how you can take the best of both worlds." (ePrincipal, interview October 2011)

Regardless of school size, teacher attitudes towards effective pedagogy were impacting on the way blended approaches were implemented, according to the ePrincipal. He added that although teachers often implemented blended web-enhanced or blended distance teaching and learning, their approaches often lacked relevance and engagement for the students:

"At the moment most of what I see that happens in terms of the e-Learning side of things, it is still replicating traditional practices, really virtualizing the classroom, so not really changing the game to any great extent." (ePrincipal, interview October 2011)

However, as the ePrincipal argued based on his experience and observations in schools across the cluster, the main factor that impacted on the adoption and effective implementation of blended approaches that stimulates change was school leaders' attitudes:

"...You won't get anywhere without the leadership buy in... We might have teachers doing innovative things but without leadership [there will not be change] – and that's where the main challenge is." (ePrincipal, interview October 2011)

The ePrincipal was also able to talk about the uptake of blended approaches, through his experience of being involved in the BTLPD by the regional ICT PD cluster in collaboration with a New Zealand university. After the first year of implementation the uptake of blended approaches and support provided to the teachers within their own schools varied, as the ePrincipal noted:

"Some of these teachers are well supported [from their school] and this enhances that sort of learning that teachers are taking on board. There are others that have done very little and sometimes that comes down to leadership, sometimes it's the teachers themselves..."
(ePrincipal, interview October 2011)

However the ePrincipal indicated that through the BTLPD there was a big potential in building schools' capacity, as some leaders' attitudes have changed positively:

“That project is quite an important way of developing some capacity across the cluster [...] School principals now see it as something that’s important, they seem to actually make it happen in their school after that.” (ePrincipal, interview October 2011)

Overall, the ePrincipal contended that the current uptake of blended teaching and learning in schools across the e-Learning cluster was at normal levels, despite the challenges, as most teachers were still at the initial stages of exploring the potential of online tools. He noted that he observed an increase in teachers’ interest in implementing ePortfolios with their students, explaining that could increase home-school connections and learner control.

For this school in particular, he commented that it was clearly one of the leading schools in e-Learning, in contrast to many other schools across the cluster. Based on his perception of the school’s infrastructure, the number of blended web-enhanced courses offered, as well as discussions with the school principal and teachers using a variety of online tools to enhance face-to-face teaching and learning, the ePrincipal noted:

“The school will be on fibre within the year, they’ve developed some capacity amongst teachers, they’ve got Teacher 6 who is an early adopter in terms of the technology side of things. So I think they are more ready [for change] than many of our schools.” (ePrincipal, interview October 2011)

4.2. The school and its culture

4.2.1. The school principal and his vision

The school principal has been in his position for the last two years (see *Table 2*). During the first interview he talked about the school's vision to enable students to become engaged and independent learners:

“Our approach is to really focus on the pedagogy, we have this goal in developing engaged and independent learners, so that the students are taking more responsibility.” (School principal, interview May 2011)

As the principal explained, there are many ways through which the school's vision could be achieved and blended teaching and learning was one of these strategies. With regard to student independence in particular the school principal explained that:

“A lot of the online tools enable it to happen: rather than being the teacher who holds that information and gives it to the students, [the students] can use other ways of accessing the information, interacting with it and processing it.” (School principal, interview May 2011)

However, the school tried to promote the idea amongst teachers that using ICT is not a panacea and that effective pedagogy should always underpin their approaches, either involving ICT or not:

“Our focus is not that various ICT and online tools are the answer, but they are just a tool. At the base you still need to have good teaching.” (School principal, interview May 2011)

However, as the school principal noted, although ICT can change teaching and learning, the degree to which change is necessary depends on the subject:

“There are lots of subjects that the impact has been minimal, because maybe they don't need to change, maybe the models they've been using have always been successful and you don't add to it by doing something else.” (School principal, interview May 2011)

Amongst the other advantages that the school principal identified in blended teaching and learning was the flexibility it provides to teachers and students. In particular, he commented that such approaches have the potential to expand the boundaries of the class. He also acknowledged that blended education can increase connectivity between students, also implying increased connectivity amongst schools:

“There are now tools available that are stepping towards more of that happening; students collaborating online with other students in their class, other students in other schools, other countries.” (School principal, interview May 2011)

Overall, the school principal's comments about the school's vision for engaged and independent student learning showed that the school moved towards the direction that the e-Learning cluster promoted, especially with regard to changing teaching and learning, by increasing personalisation. In addition the school principal's perception of the potential of blended approaches to increase flexibility and collaboration is very interesting, given the e-Learning cluster's vision to increase collaboration and the ePrincipal's comments about the need to enhance connectivity.

4.2.2. Blended teaching and learning at the school

Two of the modes of study available at the school involved blended learning. Referring to the first mode, blended distance learning, students mainly in Years 11-13 could enrol in blended distance courses through the VLN that involved one hour of video conference with their eTeacher and three hours of self-study. The school had a room specifically for the video conference sessions. The students could also access their blended distance course's online learning environment on Moodle, from school with the onsite support of the eDean (Teacher 1) and from home. At the time of the study, approximately eight students from the school (out of approximately 750 students in total) were enrolled in blended distance courses. The school also had three eTeachers (out of the approximately

60 teaching staff) who were teaching blended distance courses through the VLN, two of whom participated in this study (see *Table 2*).

With regard to the second mode, blended web-enhanced learning, some teachers, five of whom participated in this study (see *Table 2*) were blending face-to-face with online teaching, offering blended web-enhanced courses. In these courses teachers implemented a variety of online tools depending on their class's needs. There was no distinct boundary as to when blended web-enhanced teaching and learning started to be implemented at the school, as teachers have been experimenting with online tools in their classes for some years. The school principal explained that offering blended distance courses through the VLN for the last 10 years, where teachers taught through video conference and Moodle, encouraged many teachers to use Moodle for their face-to-face courses as well. For example, when a French language teacher (Teacher 2) started teaching a blended distance course in 2010, she was encouraged to use Moodle for her traditional face-to-face courses, and she started transforming them into blended web-enhanced courses (see *Table 4*).

It is interesting to note that it was in 2008 that the first teachers started to use Moodle as an LMS in the school to develop blended web-enhanced courses, and by 2010 the school had developed more than forty blended web-enhanced courses with almost 500 students and teachers enrolled in total. In 2009 Moodle was also used to provide some peer-professional development amongst some staff members (from the BTLPD website, April, 2011).

The school had also recently upgraded its infrastructure; every class had a data projector and most classes had one computer. Two sets of 16 netbooks were available for all the teachers (approximately 50 in total) to book and bring to the class. The school also had two computer labs and computers in the school library. The students could also bring to school their own devices, but at the time of the study there was no official school policy for BYOD (Bring Your Own Device).

The school principal added that as more and more tools started to become available and as the school upgraded its infrastructure, teachers were encouraged to experiment with blended approaches, as for example, many teachers were using Wikis and other online tools (e.g. ePortfolios, Facebook) in their face-to-face courses. As the school principal explained, although there had been a stronger encouragement from the school to use Moodle, which was the school's formal LMS as part of their engagement with the VLN, the school was very open in encouraging teachers to use any tool they found relevant to the needs of their classes:

"I am quite open to teachers using a variety of tools that are out there, which best suit their context and whatever they are trying to do and their particular confidence with different technologies." (School principal, interview May 2011)

The school principal saw that the school's approach to encourage teacher experimentation with a variety of tools reduced teacher resistance to change, as they could make their own choices depending on their needs and confidence:

"[Being forced to it] builds up the resistance and doesn't necessarily end up with a better outcome." (School principal, interview May 2011)

Teacher confidence with ICT seemed to be an important factor impacting on the uptake of blended approaches at the school. For example, some teacher participants explained that at the beginning of their experimentation with a variety of tools they were willing and confident enough to walk the extra mile and face new challenges:

"It will be different, there will be things I'll need to learn and there will be skills I'll need to pick up. I quite like that, you can get really jaded if you do the same things, so it's nice to have the change." (Teacher 3, interview September 2011)

The school principal noted that the Teacher Laptop (TELA) programme and the school's involvement with the VLN also had a big impact on enhancing teacher confidence in using ICT. Furthermore, student and parent impact was acknowledged from the school principal as influencing the uptake of blended approaches:

"There is also a driver from the parents and the students. If they've experienced it [using an online tool] in one class or they hear about the use in one child's class, then they'll talk to their friends, the friends talk to the teacher, the parents talk to them. So you build up kind of a 'moral pressure' almost to make changes and to get things happening." (School principal, interview May 2011)

Student impact was also confirmed by some teachers, as for instance Teacher 5 who, during one of the interviews explained that, although she implemented various tools in her Year 7 Homeroom class, some students requested to use VLN portfolio, as they had siblings in other classes who were using that tool as well. Some student participants confirmed their expectation to use ICT in more of their classes, illustrating the need for capacity building among teachers, as discussed in the next section (see *Findings/The school and its culture/Challenges of blended teaching and learning*).

In contrast, Teachers 4 and 5 highlighted opposition from some parents regarding the blend of online and face-to-face approaches within a course, which posed additional barriers to them as discussed later, presenting challenges with parental involvement (see *Findings/The school and its culture/Challenges of blended teaching and learning*).

4.2.3. Professional development and support

Teachers' freedom to experiment with a range of tools in their classes, depending on their objectives and confidence was also encapsulated in the school's approach to professional development. The teachers were encouraged to set their own individual goals at the beginning of each year and work through achieving them using an inquiry process:

"...all the teachers have a key goal that they choose themselves, they have something that they are working on and we are trying to find ways of supporting it [...] We haven't at this point put any restrictions." (School principal, interview December 2011)

Teachers' freedom to set their own goals, in conjunction with their freedom to experiment with a variety of tools, made them more open and less resistant to change, as discussed previously (see *Findings/The school and its culture/Blended teaching and learning at the school*). Some teachers selected blended teaching and learning as part of their inquiry. Teacher 6 for example decided to lead a professional development group where the interested teachers would use ePortfolios for their own professional development and investigate the ways they could use them with their students. Teacher 3 decided to join the school's Moodle professional development group, which was already offered to other teachers who were interested:

"The school here started this PD with Moodle groups and that's what got me thinking [of implementing blended approaches]." (Teacher 3, interview September 2011)

The school principal explained that the teachers had the flexibility to begin their own professional development groups, depending on the number of staff members that were interested. These groups were led by the teachers themselves, who shared their experiences and knowledge with their colleagues and supported one another. At the time of the study, the school coordinated some of the teachers' professional development, through the development of a Moodle site, which was initiated by Teacher 6, after his first University course as part of his involvement in the BTLPD. The PD Moodle site (see *Figure 5*) included announcements regarding professional development and useful resources; an online forum was also provided where according to Teacher 6's comments, staff were actively engaged in online discussions.

"I've created a new PD course for all staff to join. We've begun two discussion topics for fun, to get people in the swing of using the forum. [...] I've just finished reading through all of the posts and there are just some wonderful comments and discussions happening already."
(Teacher 6, reflective journal on VLN portfolio for BTLPD, March 2011)

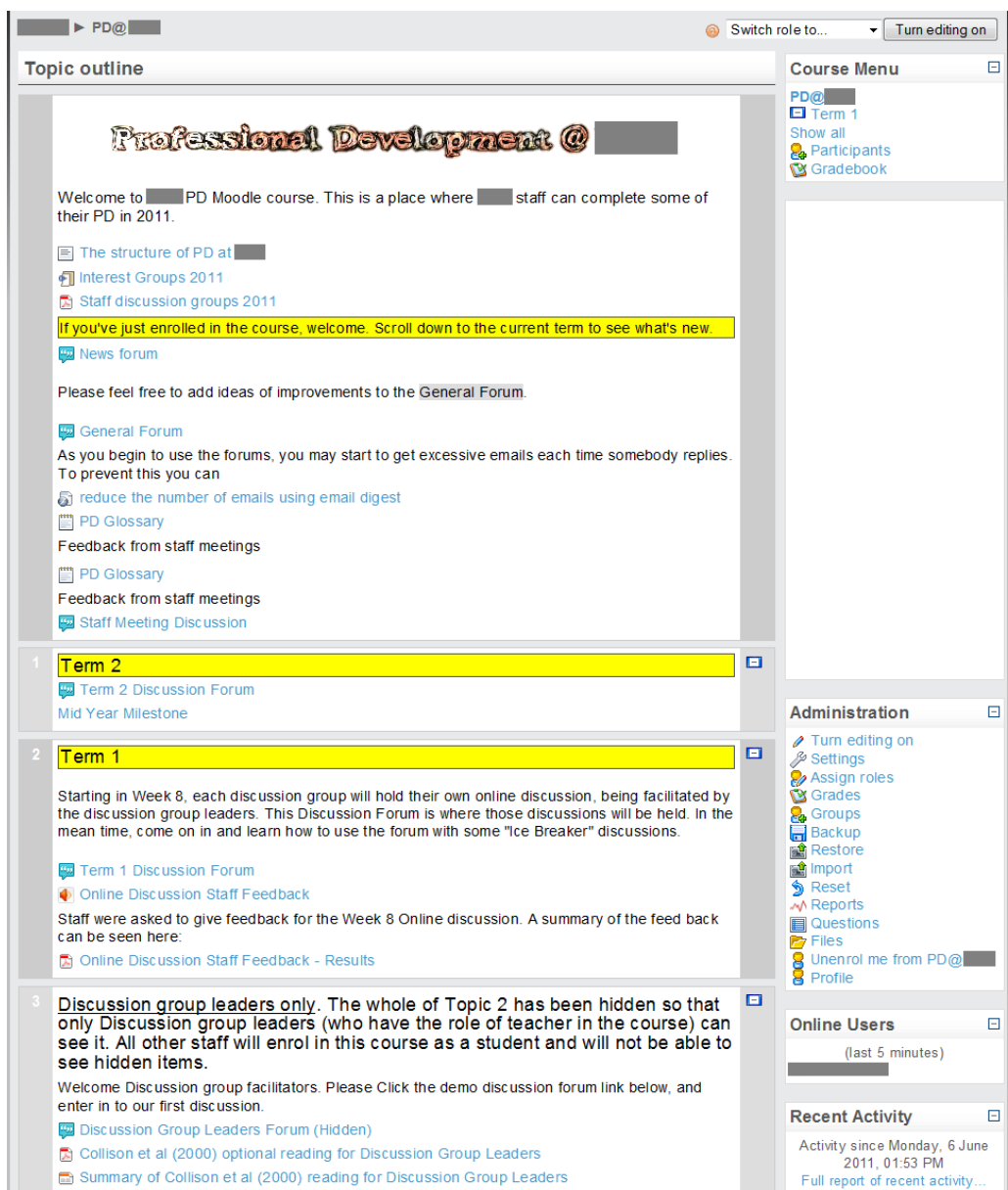


Figure 5. Overview of the professional development online environment at the school, set by Teacher 6 (June 2011)

According to the school principal the school managed to begin building capacity among teachers through its involvement with the BTLPD offered by the regional ICT PD cluster in collaboration with a New Zealand university. The teacher who was involved in the project (Teacher 6) and was completing a Postgraduate Certificate on e-Learning, not only enhanced his knowledge and skills on blended teaching collaborating with other teachers across and beyond the cluster, (including sharing knowledge at the national ULearn conference in 2011, see <http://ulearn.core-ed.org>), but he also provided professional development and support to other teachers from the school who were interested in implementing online tools, as discussed previously. The school principal acknowledged his contribution:

“...the things that he [Teacher 6] is picking up and learning and developing with the blended learning, sort of come through with his enthusiasm and his support for people implementing LMSs like Moodle.” (School principal, interview December 2011)

As the school principal explained, one of the reasons he supported this project from the beginning was the opportunity for capacity building among staff members:

“The reason I was one of the supporters is that I think if we are up-skilling our staff, then there's the potential of happening what is happening when they are here[at school] and they can share what they've learned with the rest of the staff.” (School principal, interview December 2011)

Being also a member of the contributing schools' ICT PD cluster, the school had the opportunity to collaborate with other schools in the surrounding areas. In the year of the study the involved schools were getting additional support and professional development, customized to teachers' needs, approximately three times per term, by experts in a private education consultancy company. The company provides a range of e-learning professional development services to schools, aiming to increase school leaders' capability to lead e-Learning integration in their schools and teachers' capability to effectively implement e-Learning into their practice (from the company's website, April 2012).

“...they offer specific courses based on people's needs. They suggest some things and we suggest some things and people come and do a course out here.” (School principal, interview December 2011)

4.2.4. Teacher participants and their vision

The six teachers who participated in this research were using a variety of tools and methods with blended teaching and learning (see *Table 4*). Two of the teachers were also eTeachers (Teachers 1 and 2) and used video conference and Moodle as a default environment to teach their blended distance courses through the VLN. Other teacher participants (Teachers 3, 4, 5 and 6) who offered or planned to offer blended web-enhanced courses, were using a range of tools depending on the needs of their classes (e.g. Moodle, VLN portfolio, wikis). Some teacher participants (e.g. Teachers 1 and 6) also had leading roles regarding blended approaches at the school. Teacher 1 was also the eDean at the school, providing onsite support to blended distance course students and sharing his expertise with other teachers interested in using similar tools and approaches. Teacher 6 was one of the early adopters of blended web-enhanced teaching and as part of his involvement in the BTLPD by the regional ICT PD cluster in collaboration with a New Zealand university, he often shared his skills and experiences with other colleagues within and beyond the school.

Teacher 1	<p>Blended distance course eTeacher</p> <p>This experienced Physics teacher was teaching NCEA Level 3 Physics by distance through the VLN. He also taught the course face-to-face to students who were based at this school. Ten students from various areas in New Zealand were enrolled in this teacher's blended distance course, using video conference and Moodle. Email and text messaging were also used for extended student-teacher communication. This teacher was one of the first eTeachers at the school and was also the school's eDean for the students that were enrolled in other blended distance courses.</p> <p>He often worked together with other eTeachers within the school, supporting one another. Owing to his experience with blended distance courses he often provided help to other teachers who used Moodle in their face-to-face classes.</p>
Teacher 2	<p>Blended distance course eTeacher and Blended web-enhanced course teacher</p> <p>This French language teacher was teaching Year 11 French (NCEA Level 1) through the VLN for a second year, using video conference and Moodle. Three of her blended distance course students were based at this school and they often had the opportunity to contact her face-to-face for any questions they had. For the rest of the distance students communication through Moodle and email was the main means of communication with their teacher beyond the one hour of video conference. The on-campus students also had the opportunity to benefit from an exchange programme that was organized for the students in the school who were studying French at other levels. This teacher was also implementing blended approaches in her different face-to-face classes (Years 7-13 French language, including NCEA Levels 2 and 3) to a limited extent, mainly to enhance student motivation and engagement with activities that could be presented in a more appealing way. Moodle was also used in her face-to-face classes as a space where students could access the course resources in their own time.</p>
Teacher 3	<p>Teacher planning to teach a blended web-enhanced course</p> <p>This experienced Technology curriculum teacher was planning to implement blended web-enhanced teaching and learning in his senior Technology classes from the following year. Moodle would be the LMS that would be embedded in the face-to-face learning environment, aimed at enabling the teacher to offer the students more options with both achievement and unit standards. The teacher planned to give students access to relevant resources and tasks for the achievement standards through Moodle. When working on achievement standards, students would be working at the computer lab at their own pace and the teacher would be able to teach the unit standards students in the technology lab face-to-face at the same time.</p>

Teacher 4	<p>Blended web-enhanced course teacher</p> <p>This Year 8 Homeroom teacher, used ePortfolios (VLN portfolio by Mahara) with her students in English, Maths and Social Studies. An online space (StudyLadder) was also used to enhance student learning, involving online interactive activities that the students could engage with independently, in their own time. At the time of the study, the teacher had set up an ePortfolio page for the whole class and every student had their own profile and separate ePortfolio page. In their ePortfolio pages, the students approximately once a week in class were uploading some of their work, they reflected on their learning and set goals on their own for the following weeks. The parents could also access students' ePortfolios, as well as the whole class's page on VLN portfolio. For this teacher, this was the first year of implementing ePortfolios in her class.</p>
Teacher 5	<p>Blended web-enhanced course teacher</p> <p>This teacher implemented a variety of online tools in her Year 7 face-to-face class. Some of the main ones used, especially for English and Social Studies, were Moodle as an LMS, Wikispaces as a collaborative learning space where the students could make their own contributions, VLN portfolio by Mahara as an ePortfolio for every student and StudyLadder as an online interactive activity space. The students were also encouraged to use various online tools, depending on their skills and confidence (e.g. Prezi, Glogster, GoAnimate). For this teacher who often shared her expertise with other colleagues from the school, this was the third year of implementing blended approaches with her students, experimenting with a variety of tools.</p>
Teacher 6	<p>Blended web-enhanced course teacher</p> <p>This Science teacher used ePortfolios (VLN portfolio by Mahara) with his Year 9 students as a form class activity and Moodle especially for the Year 9 Science course. He also incorporated a variety of Web 2.0 tools to enhance face-to-face Science teaching and learning (e.g. Voicethread, Microsoft Movie Maker, Animoto, Google Docs etc.).</p> <p>He was one of the early adopters of blended online teaching and since 2008 he has developed more than 10 blended courses for his students, specializing in Science and Physics. The school has appointed him as a specialist classroom teacher, with the role of helping his colleagues to improve their pedagogy. At the time of the study, the teacher was involved in the BTLPD, offered by the regional ICT PD cluster in collaboration with a New Zealand university. This teacher shared his knowledge and skills with other colleagues within the school and across the BTLPD project schools,</p>

	often providing professional development to other teachers, which focused on using blended approaches in the classroom. In 2011 he successfully completed his first two University courses in the Postgraduate Certificate on e-Learning.
--	---

Table 4. Background information on teacher participants and their use of blended approaches

All teacher participants' vision was aligned in general with the school's vision for engaged and independent learners, as findings from the interviews show. All teacher participants talked about their aim to increase student independence, whether this was the main objective of their vision or one of their other priorities. For example:

"I'm trying to make students independent learners. So, not teaching students the facts, but teaching them how to find the facts and how to learn for themselves." (Teacher 4, interview September 2011)

"[Long term, what I am trying to achieve] is to make them more independent learners and also to get them up to the level of the curriculum that we are giving them." (Teacher 1, interview September 2011)

Teacher participants had positive views regarding the potential of blended teaching and learning to address their vision for independent student learning. For example, in her blended web-enhanced class, Teacher 5 often encouraged her Year 7 Homeroom students to work online and self-direct their learning in class with minimal intervention from her. She commented that implementing online tools that enable learning beyond school hours provides students with plenty of opportunities to learn independently:

"It does really help them to achieve the goals of becoming independent learners, so that they can access things at their own time, they can access them at school, at home, in the library, from the public library." (Teacher 5, interview September 2011)

Commenting on the school's vision to enable students to become engaged and independent learners, Teacher 6 argued that student independence was one of his goals, as part of his vision to engage students in lifelong learning, but there were several limitations involved. Teacher 6 explained that in Science, students cannot be completely independent, as there are some basic facts that they cannot discover by themselves and that at some level, lecturing is an effective approach. However, as he noted:

“I am trying to teach them so that they don’t have to learn lots of things; you just have to learn a few principles and then be able to reason things through.” (Teacher 6, interview September 2011)

Teacher 4 said that in real life people use both online and face-to-face media to learn by themselves. Therefore, a blended web-enhanced class could equip her Year 8 Homeroom students with the skills they would need to learn independently in the real world:

“I think blended learning is essential, because this is what we do in the real world. We don’t do anything in isolation and I think it is essential that students build the skills to be able to use mixed media to find information and to develop their own awareness.” (Teacher 4, interview September 2011)

Teacher 6 also saw a great potential in using a variety of media, aimed at helping students to improve their quality of work. He explained that this had the potential to enable students to become lifelong learners, as they build on what they learn, through reflection. Teacher 6 saw a great potential in the use of ICT to improve quality and he talked about the need for students to develop multi-modal literacies. As he explained, people need to be confident enough to use ICT independently in today’s world and this can be achieved by enriching teaching and learning with a variety of media. For example, in talking about Science:

“[I’d like to] change the way we do experiments to a more 21st century way. [...] You can have all of that digitally, the whole aim, method, results, conclusion – with some video, some photo, some written, some graphing – rather than having to do everything with a paper and pen.”
(Teacher 6, interview September 2011)

For all teacher participants, the school’s vision to increase learner engagement was an important priority they were working towards, even if it was not mentioned as the main objective of their vision. For example, Teacher 3 who taught junior and senior Technology acknowledged that through a blended approach he could provide two different subjects that would engage students more and enable them to follow their interests. Teacher 5 argued that one of her goals in her blended web-enhanced course was to engage all Year 7 students through their own learning styles.

The interviewed teachers also had other priorities, related to their curriculum area. For some of them these priorities were part of their vision. For example, for Teacher 6, enabling students to develop scientific knowledge/thinking skills was an important priority for his Science classes. For Teacher 2, exposing students from a rural area to a different culture and helping them to become more open-minded, was an important part of her vision for her French language courses. This teacher compared her experience teaching blended web-enhanced courses and teaching a blended distance course and

explained that face-to-face contact with the students is pivotal to enable her to have a cultural impact on them and achieve her vision:

“To be honest, through video conference there is much more focus on the language, much more focus on the grammar and the technicality of the language and much less on the communication aspect of things.” (Teacher 2, interview October 2011)

4.2.5. A blended web-enhanced class

In addition to the use of blended teaching and learning at the whole school in general, the embedded case study of one Year 9 class taught by Teacher 6 provides greater detail. Teacher 6 was one of the first teachers to use blended approaches in his classes. Both the ePrincipal and the school principal acknowledged Teacher 6's leading role in terms of the uptake of blended teaching and learning at the school, as well as his impact on other teachers' capacity building.

In summary, Teacher 6 had the vision to improve students' quality of work, scientific thinking skills, lifelong learning and ICT skills (see *Findings/The school and its culture/Teacher participants and their vision*). This vision, especially in terms of providing students with ongoing access to their learning and enabling them to become lifelong learners, equipped with useful ICT skills, was aligned at some level with the school's vision for independent and engaged learners, as well as the cluster's vision for change in school structures. The level of change that Teacher 6 envisioned was clearly impacted on by the curriculum area and goals (Science) and the aim of enabling students to develop reasoning skills and acquire scientific knowledge, before independently developing further knowledge. The impact of the teachers' curriculum area was also noted by the school principal, when discussing the need for change in different subjects (see *Findings/The school and its culture/The school principal and his vision*).

Teacher 6 used one of the four teaching periods to engage students in blended learning as a form class activity, but he also blended several online teaching and learning components in his Science teaching. The main tools that were used were VLN portfolio (developed using the Mahara software) and Moodle, each of which served a different purpose. VLN portfolio was used mainly as a Year 9 form class online environment, where the students could showcase their best work from different subjects and reflect on their learning. The potential Teacher 6 identified in using ePortfolios was for students to be further motivated to put more effort into their work, as they would share their learning with other students and their parents, as well as the teacher. They would also have the opportunity to easily collect and organize their work from anywhere at anytime, and therefore build on what they learn with appropriate guidance:

“This is a way of going back over things that you have learnt, having a nicely organized presented folder or book is much better than having scrappy notes all over the place. And so you can therefore build on what you’ve learned.” (Teacher 6, interview September 2011)

Initially, Teacher 6 set up an ePortfolio group page for the whole class where the students were informed about their weekly tasks. A variety of other resources were also shared, including examples of student work (e.g. student presentations recorded in class and photos taken during Science experiments). The group’s ePortfolio page also offered a forum for asynchronous online discussions that the students could use to post questions, comments or answers to questions from the teacher.

Figure 6 illustrates the Year 9 class’s page on VLN portfolio; it includes a section with information on students’ weekly tasks, an overview of latest forum posts, a shared example of one student’s work, a section linking to students’ shared pages and an overview of members of the page.

In addition, every student had their own ePortfolio account; they all had their own profile pages where they included information about themselves and their interests and links to other ePortfolio pages they created or groups they were members of. Therefore, all students had a profile page, an individual ePortfolio page for their Year 9 form class and they were all members of the Year 9 group page. Each student also had their own blog page, which was embedded in their ePortfolio and they used it for weekly reflections on any subject (as a form class activity). The students could share their pages with their teacher, their friends or their parents. They could add other users on their friends' lists and control the publicity of their pages, sharing their content with people in their friends’ lists, specific VLN portfolio users or other people through a secret URL.


An example of one student’s profile page is illustrated in *Figure 7*, including a section with information about the student, a list of the student’s friends and groups, a section linking to the students’ ePortfolio page, a ‘wall’ where the student and her friends added comments, as well as pictures that the student wanted to share. *Figure 8* illustrates an example of another student’s ePortfolio page, including information about the student, the latest entries from the student’s blog (embedded in the ePortfolio), examples of this student’s work and a section where other students and the teachers could provide feedback.

Teacher 6 encouraged the students to use a variety of tools to undertake their tasks for their Science course (e.g. Voicethread, Microsoft Movie Maker, Animoto, Go Animate, Google Docs etc.), which they could then embed in their ePortfolio pages, as files in various formats (e.g. videos, slideshow presentations, audio files, spreadsheets, word processing documents, images etc.). In addition, with Teacher 6 also being the Year 9 class Science teacher, activities were often focused more on Science. The students used the ePortfolio tool in class once a week (using one of the four Science teaching periods) in the school's computer room in the presence of the teacher with his support. They were also

encouraged to use the online environment from home in their own time, where they had access to a computer and the internet.

The teacher also set up an online learning environment on Moodle, specifically for the Year 9 Science course. The online course consisted of several topics, depending on the face-to-face Science course's structure, and each topic had links to resources (e.g. videos, documents, graphs, hyperlinks with more information or online Science games) that the students could refer to in their own time, either to supplement their face-to-face learning or to access lessons that they may have missed.

The Moodle online environment also included a forum that the students and the teacher used to discuss asynchronously around Science related questions set by the teacher, other topics that the students were interested in or to provide/receive feedback. In addition, using the assignment drop box feature, the students could hand in their assignments. The students often received online feedback on their tasks, after being assessed by the teacher (for some of their assignments) or automatically (for some other online activities). A Google Calendar was also embedded in the Moodle environment that the students used to keep up with their task deadlines throughout the year. *Figure 9* provides an overview of the Science course's online learning environment (teacher view), including the course menu, a main section with all the topics, an activity box with quick access to different activities and an administration section, where the teacher could control the layout and contents of the online environment.



[Dashboard](#)
[Content](#)
[Portfolio](#)
[Groups](#)

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[My Friends](#)
[Find Friends](#)
[Shared Pages](#)
[Topics](#)

You are a member of this group
[Leave this group](#)

[About](#)
[Members](#)
[Forums](#)
[Pages](#)
[Share](#)
[Files](#)

A group for [redacted] to share their ePortfolios with others

Welcome to [redacted] group page

[redacted] are busy creating their own ePortfolios this year. The purpose of their ePortfolios is to showcase their work and reflect on their learning. This group page is for the students in [redacted] to check in with what is new for them to add to their own ePortfolios.

Latest Forum Posts

What do you want to do with ePortfolios this term?
we would like to have more time to make videos about our work.

What do you want to do with ePortfolios this term?
what type of learning games?

from [redacted] and [redacted]

What do you want to do with ePortfolios this term?
[redacted] and [redacted]

I think we should have more pictures of our work. Maybe every once a month...

What do you want to do with ePortfolios this term?
that sounds good


What do you want to do with ePortfolios this term?
from [redacted] and [redacted]

more colour and pictures, as well as assignments from other classes...

[Go to forums »](#)

What makes a good title page?

[redacted] is trying to get [redacted] to produce high quality work that each student is proud of. To help with this here are some examples of some of the best Title pages done by several classes. We have made comments about them, saying why they are good title page.



Shared Pages

Pages shared to this group by others

[ePortfolio](#)
by [redacted]

[ePortfolio](#)
by [redacted]
A view to be used by [redacted] for their ePortfolio's in 2011

[learning portfolio](#)
by [redacted]

[ePortfolio](#)
by [redacted]

[Copy of 9MM ePortfolio](#)
by [redacted]

[Copy of 9MM ePortfolio](#)
by [redacted]
A view to be used by [redacted] for their ePortfolio's in 2011

[portfolio :-D](#)
by [redacted]

Tags: [Portfolio](#)

by [redacted]

by [redacted]

by [redacted]

[e-portfolio](#)
by [redacted]

[e portfolio](#)
by [redacted]

Group admins: [redacted]

Group type: Invite Only

Created: 03 March 2011

Members: 34 Pages: 2 Files: 37 Folders: 2

What have we been doing?

Use this list to check how much some people have done. If you are not sure how to do one of these things - ask a friend.

Term 3

This is the term where I hope to really develop our use of the eportfolios as a place to display examples of our best work and also some critical reflection on our learning.

Friday 7/10/2011:

Today is tuesday day. There are some really important things you need to do.

- If you would like your page to be viewed by 10 delegates at ULearn please **edit, share page, add group:** [redacted]
- Check your wall posts on your profile, your page feedback on your ePortfolio and your Journal comments. Respond and reply to any comments made.
- You may have one "non-learning" image on you ePortfolio (sheep, horse, dog, skateboard etc), all other images should be on your profile page.
- There should be no "learning content" on your profile page, move it to your ePortfolio.
- Journal entry: "The best thing about ePortfolios is..." then write a good post about what is the best thing and why you think that's the best thing.
- MovieMaker video: "The best thing about ePortfolios is..." you will find all the videos on S'Data. [redacted] The_Best_Thing_About_eportfolios_is. Copy the folder to your desktop. Open Movie Maker, import video. Use timeline view, edit video to make a compilation.
- Save movie to computer, then add file to your journal entry.

Friday 16/09/2011:

Today we took some photos of our food tests. Your homework is to add some of the photos to your ePortfolio.

- You need to show 4 different food
- Each food requires at least 2 photos (view and download them from here)
- You should give each food a title
- write the result of the iodine test (positive test iodine turns blue/black, negative test iodine remains yellow/brown)
- what the test means (contains starch/does not contain starch)
- Finally you should look at the nutritional labels of those foods and find the amount of Carbohydrates per 100g that each food contains.

You may decide to do this using a voicethread or make a word/powerpoint or publisher file. You decide which is best. If you make a file, it should be attached to a Blog/Journal post.

If you require help, email me or speak to me before Wednesday lunchtime. HW due Friday 23.

Friday 08/09/2011:

- Complete Cooling graph on Excel
- Copy and save picture of graph onto my documents
- Upload your graph to your ePortfolio
- Journal post: What does this graph show?

Friday 01/09/2011:

- Embed line dancing video into your portfolio. Watch [redacted] instructions
- Journal Entry: What are your reflection on your line dancing experience?
- Share your portfolio with others in your group (you can just add for today).
- View your other group's ePortfolios and make some comments on their pages. You could:

- Comment on their page as a whole (add comment on the bottom)
- Comment on one or two of their journal entries
- Comment on their voice thread

Friday 19/08/2011:

- Make a voicethread of each reaction completed yesterday. Each reaction needs at least 3 pictures/videos: The Reactants, the reaction and the products. (images can be accessed from the Student Drive, S'Data. [redacted])
- Embed voicethread on ePortfolio
- Check access to your ePortfolio and ask others to comment on your voicethread.







Friday 12/08/2011:







- Make a voicethread of Magnesium + Oxygen reaction
- Upload voice thread to ePortfolio
- Comment on somebody elses voicethread

Friday 05/08/2011:

- Blog post: What am I looking forward to learning this year?
- Forum: there is a questions there for you to answer in groups of two or three.
- Today we have a visit from Pinelopi Zaka, a teacher from Greece who is currently a MEd student at the University of Canterbury. She has asked us if we can help her with her research into Blended learning (learning in classrooms and online).

Members

[View all Members of this Group...](#)

Figure 6. Year 9 group page for the whole class in VLN portfolio (December 2011)

Profile

Member of

Send message

Remove from friends

About Me :)

I love to do loads of bareback riding and competing 😊😊😊, i enjoy netball and school 😊😊

Dog !!!!!!!

Wal !!!

Shrek the Sheep :D

Showtym Girl :)

Friends

Groups

Member

A group for to share their ePortfolios with others

pages

E-portfolio

Wall

Maximum 1500 characters per post. You can format your post using BBCode. [Learn more](#)

Make your post private?

Post

07 December 2011, 10:56 AM

WILL!!

28 October 2011, 6:56 PM

hey wot u up 2

20 October 2011, 7:17 PM

please move your Science experient from your profile page to your ePortfolio.

05 October 2011, 8:59 PM

is so Koool i luv her soooo much luv xxx

09 September 2011, 6:45 PM

Hi wot u doin?

19 August 2011, 11:40 AM

Hae bro :)

13 August 2011, 9:57 AM

love ya pic

Figure 7. VLN portfolio profile page example by Student 1 (December 2011)

51

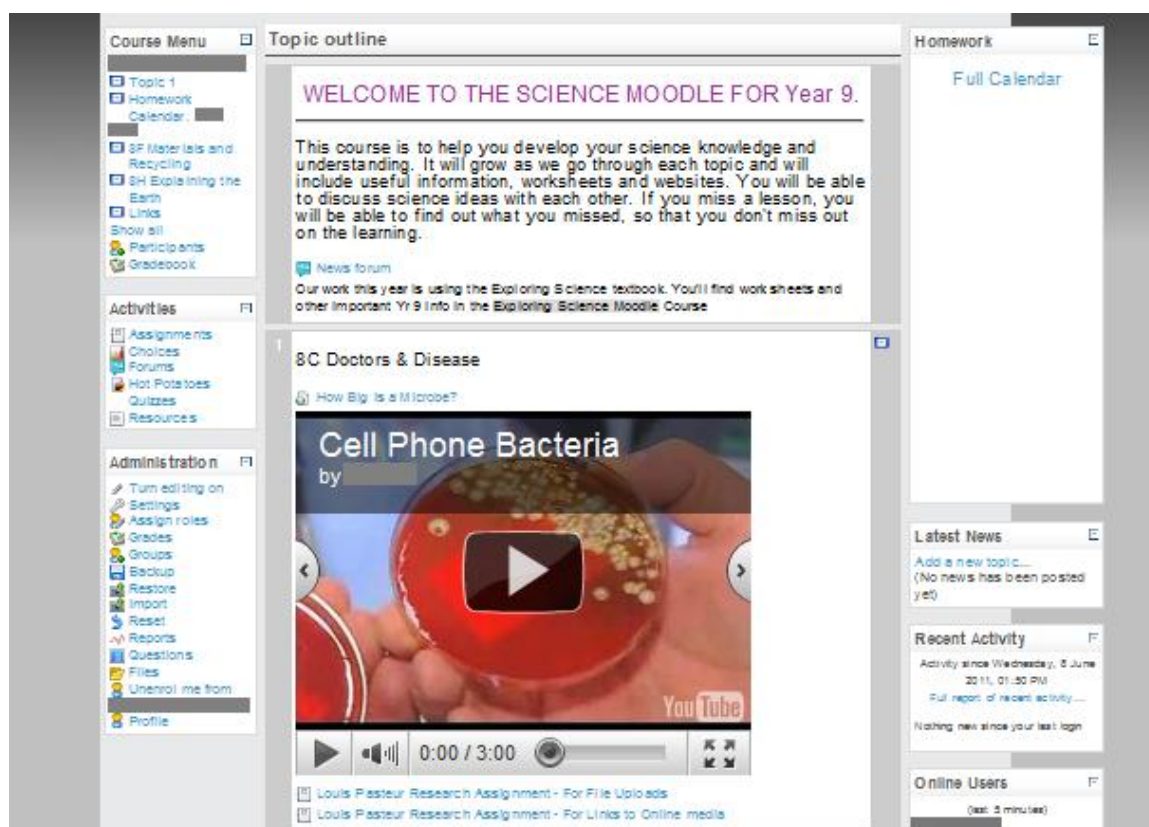


Figure 9. Teacher view of the home page of the Moodle online learning environment (June 2011)

4.2.6. Advantages of blended teaching and learning

In this school culture that encouraged experimentation with new tools and teacher choice for professional development, a range of advantages with blended approaches were observed/experienced by participants, in the main and embedded cases. These advantages are now presented in themes and are based on interviews with the participants, observations in the blended web-enhanced class and data from documentary sources. For each advantage/challenge, findings from the main case are presented at the beginning, followed by findings from the embedded case, where relevant.

Development of students' independent learning skills

As more and more teachers implemented blended teaching and learning at the school, the observed outcomes, according to the school principal, were illustrating that the school's vision for enhanced student engagement and independence was facilitated. For example, talking about blended web-enhanced courses the school principal explained:

“[The students] will go on and work with the information themselves, they don’t need the teacher standing beside them. The teacher is still there and involved at some level, but they’ve been able to do that [themselves].” (School principal, interview May 2011)

Most of the teacher participants also described how blended learning increased student independence, especially being able to access their learning in their own time or having more time to reflect on what they've learned, as discussed previously (see *Findings/The school and its culture/Teacher participants and their vision*).

For Teacher 5 in particular, students' ability to learn independently in her blended web-enhanced course was directly observed during the 2011 winter snowstorms, when the school was closed for some days. Having practised online learning with her Year 7 students previously when they were in class, some of the students were able to learn independently from home:

“ It’s worked quite well – not all of them, but a few that were keen obviously thought about it, got bored, got online and started doing their learning from home.” (Teacher 5, interview September 2011)

Blended distance learning also had a positive impact on students' development of independent learning skills. The eTeachers, both acknowledging the important role of the eDean in facilitating students to develop independent learning skills, commented that the students were encouraged to organize their study and self-engage without the teacher's onsite presence. Teacher 2 explained that:

“...it is teaching them to manage themselves, clearly much more than a face-to-face class does. I think that it is a good learning skill and that way I would probably recommend all students at some point to try to learn that way.” (Teacher 2, interview October 2011)

Students' development of independent learning skills with blended approaches was also confirmed through the findings in the embedded case. Teacher 6 observed that, although at the beginning students in the blended web-enhanced class had difficulties in confidently using the computers and they needed more direct instructions, after a few weeks they started to develop some basic ICT skills and became more familiar with the ePortfolio software. This enabled them to slowly become more confident to work independently:

“I have noticed an increase of independence when they are working. I can come into a classroom now and say get on with it. [...] I don’t have to give them specific instructions of what to do.” (Teacher 6, interview September 2011)

Whenever the students were experimenting with some new tools they needed more help and support from the teacher or each other, as shown during the observations. However, the ease of use of most Web 2.0 tools, in addition to students' increased confidence after initial experimentation, were important to enable them to progressively work more independently. For example, in the 7th week of Term 3, one of the students contacted the researcher through email to ask for a hyperlink to an online

tool (Animoto) that the researcher had shown in the classroom as an example of a different presentation tool. The student used this online tool to present an experiment with no guidance.

The teacher also noted that although most students were distracted by other websites at the beginning (see *Findings/The school and its culture/Challenges of blended teaching and learning*), they slowly began to develop self-management skills, as they were able to control at some levels their distraction:

“[Now] there are more of them doing work rather than searching for pictures of horses and searching for skateboards.” (Teacher 6, interview September 2011)

This was also confirmed during the observations for some students. For example:

“The students were working on their tasks, adding photos on Voicethread. One student had uploaded lots of photos and had his textbook open next to him, looking at the steps of the experiment. I told him that he did a really good job and that he can add a title to his images if he wants. He said that he would do that, but he had to make sure of which photos go with which experiment steps.” (Observer’s notes, visit 3, August 2011)

Although most interviewed students mentioned that they required clearer directions in order to work independently, indicating their low readiness for blended learning (see *Findings/The school and its culture/Challenges of blended teaching and learning*), three of the interviewed students (Students 3, 4 and 6) confirmed that they were able to self-direct their learning from home with little or no guidance. For example:

“That’s pretty easy doing it myself [working online from home]. Most of the time I can find the solution by myself.” (Student 6, interview October 2011)

Increased student engagement and motivation

The teachers who were teaching blended web-enhanced courses observed that, depending on their practices, student engagement and motivation were often increased. For example, Teacher 4 explained that ePortfolios increased her Year 8 student engagement and motivation, as they could communicate online and also showcase their best work:

“Because it is like a social network for them [their ePortfolio] they enjoy doing it, they engage with it and they can see why they are doing it. [...] [The class ePortfolio page] gave more motivation to the students, because they knew that if they did a really good piece of work, then that piece of work goes on the page.” (Teacher 4, interview September 2011)

Teacher 2 also argued that incorporating some online tools in her face-to-face French language classes often increased her students' motivation to practise some of their language skills:

“I find that for languages, there is a whole lot on the web ... [Some online activities] may just appear a little bit more exciting and appealing to them, than just paper and pen.” (Teacher 2, interview October 2011)

With regard to blended distance courses, the eDean (Teacher 1) explained that student engagement and motivation with this type of learning often depended on their ability to work independently:

“We’ve always had one or two [students] that actually prefer the VLN courses because it gives them the freedom and more time on the web to get things done.” (Teacher 1, interview September 2011)

Focusing on the embedded case, all student participants agreed that one of the aspects of blended web-enhanced learning that increased their engagement was the fact that they could work on the computers. For example:

“I just like it that you get to do more work on the computers. [Blended learning] changed it [my attitude towards the course subject] positively because you can be on the computers instead of writing.” (Student 6, interview October 2011)

Similarly to the eDean’s (Teacher 1) comments that some students enjoyed learning virtually as they could work at their own pace, some students and Teacher 6 also commented that student engagement was increased because of the opportunity they were given to work independently in class, instead of passively attending a lesson. For example Student 3 shared:

“The hour goes a lot quicker. You don’t have to sit there and listen all the time. I like it because it gives me time to do my own stuff” (Student 3, interview September 2011)

Moreover, the opportunity students had to interact with a variety of media was an important aspect that increased their engagement. For example, in response to student demand, the teacher incorporated in the Moodle course some online Science games that, although few students accessed them in their own time, increased student engagement in the classroom:

“Teacher 6 told the students that they could click on the link when they finish their Voicethreads and play the online game, where they would match the molecules in the right category, depending on the number of atoms. Student 2, full of excitement said impatiently: “Can’t we do it now?” The students clicked on the game and they started playing. [...] “Oh, look, Student 2 has 540 points! Who can beat that?” said Teacher 6, encouraging the students to keep trying. Student 2 blushed and smiled. The students were trying to beat the highest score, announcing their results with excitement after their successful attempts.” (Observer’s notes, visit 4, August 2011)

The use of other media, such as videos and online presentation tools was also engaging for the students in the embedded case. For example, during one of the observations, one of the students who always needed further encouragement to undertake his tasks was motivated to post a reflection on his ePortfolio blog, commenting on a video of his classmates from their Physical Education class:

“A few minutes later, Teacher 6 said to me with excitement that [student name] asked a question! He asked how to add comments on the video and Teacher 6 explained to him how to do it.” (Observer's notes, visit 5, September 2011)

Furthermore, the fact that students were able to control the layout and contents of their page (see *Figures 7 and 8*), as well as how and who they would share their pages with, were engaging factors for some of them. For example, most students included in their profile page images of their interests and they organized for themselves the way their pages were structured. Students 4, 5 and 6 shared some very interesting comments:

Student 4: With your portfolio page you can make it how you want it. You can choose...

Student 5: The colour, the pictures, the layout...

Student 6: It just feels you don't have to share with anyone else, it's just your page.

Student 4: Shows your identity, your work!

(Students 4, 5 and 6, interview October 2011)

In his literature review for a postgraduate course, Teacher 6 argued that the key characteristic of ePortfolios is that it is a personal tool that learners, rather than teachers have control over. During one of the classes, discussing this with the researcher he commented:

“Moodle is just to hand in work for the teacher, whereas with ePortfolios the students are doing this for themselves and they have a larger audience, apart from the teacher.” (Observer's notes, visit 2, August 2011)

Development of students' ICT skills

Some of the interviewed teachers provided examples of how students' experiences with blended web-enhanced or blended distance learning had the important advantage of improving their digital literacy. For instance, Teacher 5 described how her Year 7 students developed ICT skills in her blended web-enhanced course, which resulted in strengthening their confidence in using digital tools in the future. She explained that these were skills that the students remembered after the end of the year, as confirmed by a conversation she had with their teacher for the following year:

“It was six months later and they still remembered how to get in and ‘blog’ their learning, how to upload their assignments and all those things.” (Teacher 5, interview September 2011)

Teacher 2 argued that her students in her blended web-enhanced class often developed useful ICT skills in previous classes where teachers used Moodle. She added that this increased student confidence to use Moodle in the following years:

“We have here Year 7 and Year 8 teachers that are using Moodle a lot – different teachers and tools [...]. So, generally by the time they come to me [in Year 9] they are pretty comfortable.”
(Teacher 2, interview October 2011)

Similarly, students in the embedded case developed basic ICT skills, such as setting up online accounts, uploading/downloading files and posting online comments, as they had their own ePortfolio pages and were responsible for setting them up and keeping them updated (see *Figures 7 and 8*). For example, Student 6 explained:

“What was challenging for me at the beginning was learning how to work on the computers and how to put photos on there. [...] it’s easy for me to do this now.” (Student 6, interview October 2011)

In addition, Teacher 6 used a variety of tools to enhance face-to-face teaching and learning that the students could embed in their ePortfolios. This enabled them to develop new ICT skills, including multi-modal literacies, such as creating graphs and using spreadsheets, using digital devices to capture images and compose photo stories. For example Student 1 argued:

“When you do an experiment and you’ve got to put on a graph you’ve got to use the computer and you can learn more; like... when we did the graphs - I didn’t know you can do that.”
(Student 1, interview September 2011)

During the interviews, Students 2 and 3 mentioned that they often taught their parents some of the ICT skills they developed in class. For example:

“My parents don’t know how to use the computer, so I can help them.” (Student 2, interview September 2011)

Teacher 6 acknowledged that students had improved their ICT skills since the beginning of the implementation. For example, in his online reflection journal he mentioned:

“Last week was a bit of a milestone with the Year 9 class. There was quite a buzz in the classroom as students started to find their way through the site and even [student name] was adding friends to his profile. Many students were able to use the Yellow list on the group homepage to work their way through the tasks that some have covered. Well done class!”
(Teacher 6, reflective journal on VLN portfolio for BTLPD, April 2011)

Giving another example, Teacher 6 commented on students' photography skills' improvement, when they used their digital cameras to take photos of their experiments:

"First time they were taking photos they were just taking photos badly, but they actually improved their photography skills. You were in the lesson where we taught them what the little 'flower' button does, it allows to take close up photos. They actually arrange their shot so they can take a good photo." (Teacher 6, interview September 2011)

This was also observed in class by the researcher, where students were becoming more and more confident in using new tools. For example:

"The students went back to their work and most of them used the new software to take a screenshot of their graph and upload it on their portfolio. I asked two or three students why they chose to use this method and not something else (e.g. upload the xls file) and they all said that this seemed easier." (Observer's notes, visit 6, September 2011)

Increased flexibility and student choice

Teacher participants and the school principal acknowledged that with blended approaches students at the school could learn from anywhere. For instance:

"It doesn't need to just happen in the classroom, it can be happening at home." (School principal, interview May 2011)

"The content, the courseware, the notes and the tasks will be set up on the Moodle. The students will work depending on their time and pace." (Teacher 3, interview September 2011)

The advantage of flexibility was directly observed by Teacher 5 during the 2011 snowstorms as mentioned earlier in this section, which not only enabled students to access their learning from home, but also to develop independent learning skills.

Teacher 6 in the embedded case confirmed that the blended web-enhanced course enabled the students to have access to their learning from anywhere, which in turn encouraged them to build on what they had learned. This was a key component of his vision to engage students in lifelong learning, as discussed previously (see *Findings/The school and its culture/Teacher participants and their vision*):

"There is value in putting time into digitizing work. The kids will be able to access the work that they've done on their ePortfolios, much more than if we did the portfolios in a bit of a folder." (Teacher 6, interview September 2011)

Some students were accessing their ePortfolios from home, either because the teacher asked them to complete a task and upload it on their page, or because they wanted to update their profile or ePortfolio pages. Student participants also confirmed that they often used their class ePortfolio group or Moodle page to catch up with their lessons, especially in the case of being absent from class. For example, Student 5 explained:

“We have the calendar online in the ePortfolio. And if I need to catch up, if I’ve just been away and want to check if we’ve got any homework I just go in there.” (Student 5, interview October 2011)

The advantage of flexibility was also mentioned as a benefit for the teachers themselves. For example, Teacher 5 mentioned that blended web-enhanced teaching enabled her to work with different teams of students at the same time. The teacher explained that this flexibility was very beneficial especially to low achieving students, who were given more opportunities for personalized support:

“When they are independently working [online] in class, I can just work with a little focus group.” (Teacher 5, interview September 2011)

The same teacher added that using an online tool (StudyLadder) with interactive activities that automatically marked students' online homework, gave her more flexibility with her planning and preparation time to focus on other things that can enhance student learning.

Teacher 3 argued that using Moodle for his achievement standards students would give him the flexibility to teach both achievement and unit standards at the same time. Student choice was also an important advantage that Teacher 3 identified in using this approach, since he would provide students with more options to follow their interests. Teacher 3 commented that this was particularly important, especially for students that were more practically orientated, since the Technology curriculum, being focused more on academic skills, was not very attractive to them:

“Technology is a non attractive subject to a practically orientated student. So they don’t do it, they do something else. This way I can bring students into the technical skills, the crafts area [...] When you blend these two subjects, the unit standard and the achievement standard, you get a balance. The students are allowed to express themselves in a practical sense and in an academic sense.” (Teacher 3, interview September 2011)

Moreover, student choice was one of the most significant advantages of offering a blended programme that included blended distance courses in addition to face-to-face ones, as reported by the eTeachers and the school principal. This was particularly important for students in Years 11-13 who were interested in courses that their school could not offer. Teacher 2 explained that her Year 11 French language course could not be offered face-to-face at the school, because of low student

demand. However, three students from the school who were interested in the course, still had the opportunity to take it as a blended distance course through the VLN.

As the eDean (Teacher 1) explained, this was the reason that encouraged him to become an eTeacher, as he knew that there was a shortage in schools of Physics teachers, especially in smaller rural schools:

“Physics is sort of a specialist subject and many of schools can’t afford to have a Level 3 qualified Physics teacher, so it’s quite different for them.” (Teacher 1, interview September 2011)

In the year of this study, Teacher 1 and Teacher 2 were offering their courses to approximately twenty students in total, from all over New Zealand.

Increased interactions

Teacher 4 explained that by implementing ePortfolios in her Year 8 Homeroom class, the students were given more opportunities to interact with each other, which also increased their engagement, as discussed previously in this section. Similarly, Teacher 5 who was teaching in a blended web-enhanced Year 7 class explained how ePortfolios increased student-student interactions, as they could connect with one another online and communicate asynchronously. Teacher 5 pointed out that students often overused the social aspect of their ePortfolios, by creating online groups that were not always relevant to their learning. However, Teacher 5, although she expressed her frustration regarding students’ online social networking overuse, acknowledged that this provided them with the opportunity to experiment with social networking in a relatively safe environment that the teacher could monitor and provide adequate guidance to communicate responsibly:

“If they are being silly on VLN [portfolio] or communicating that way, at least it’s a relatively safe environment for them to experiment and do things [compared to Facebook], and I can keep an eye on things, so it doesn’t get out of hand.” (Teacher 5, interview September 2011)

The embedded case study also illustrated the increased interaction opportunities that blended web-enhanced learning provided, either online or face-to-face. For example, both the teacher and the students talked about increased student-student collaboration in the face-to-face classroom, where the students were helping and supporting one another in learning new skills. This was also apparent in most of the onsite class observations:

“There’s kind of six or seven quite able kids in the class who were well placed around the classroom and they started to be able to help.” (Teacher 6, interview September 2011)

The students collaborated for several tasks during the Term 3, as for instance when they were experimenting in the Science lab, taking photos of their experiments, which they then used to create an individual or group presentation (also see *Figure 8*):

“The three girls in the next group were working together, writing all the names of the substances they used. Then they tried to place their items in such a way that they could take good photos.” (Observer's notes, visit 7, September 2011)

Students could also provide and receive peer feedback on their tasks. Teacher 6's guidance was important to encourage meaningful interactions; for example, in the fifth week of Term 3, the teacher asked the students to look at each other's ePortfolios and write some comments on how to improve them (see *Figure 10*). At the end of Term 4 the teacher concluded:

“The students did enjoy looking at other's ePortfolios and there was some good constructive feedback given by the students to each other.” (Teacher 6, reflective journal on VLN portfolio for BTLPD, December 2011)

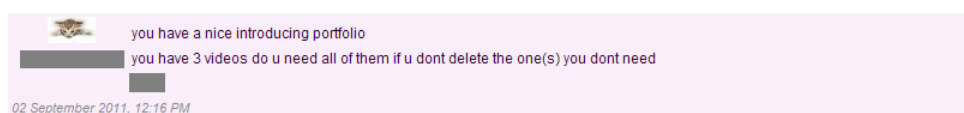


Figure 10. Student 5 commenting on Student 6's ePortfolio page (September 2011)

It was clear from the observations that student-student interactions within the online environment were influenced by their prior relationships with each other, as during most group activities the students were collaborating with their closest friends. However, the teacher often encouraged the students to interact with additional classmates.

When working in the online environment of ePortfolios from home, student-teacher interactions were also enhanced, as, despite the increased time demands (see *Findings/The school and its culture/Challenges of blended teaching and learning*) Teacher 6 made his online presence apparent to the students. The students often emailed the teacher for help when they were online and Teacher 6 frequently used the 'Comments' in the ePortfolio to provide them with feedback and guidance (see *Figure 11*).

“If the teacher asks us to do something about VLN like writing a post or something, he will type and ask me, so you go on and do it. He reminds you – he checks them constantly.” (Student 5, interview October 2011)

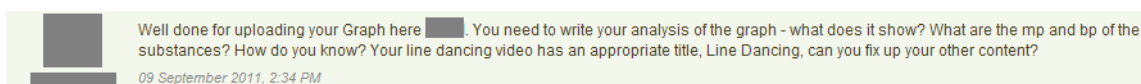


Figure 11. Feedback from Teacher 6 on a student's ePortfolio page (September 2011)

The students valued the fact that they could contact the teacher after school, asking for help and support when needed, either by using the 'Comments' feature of ePortfolios, or by sending an email:

"You got a web chat in the bottom [of your ePortfolio], you can always ask questions and go to Teacher 6 and ask "what do I do for this?" (Student 4, interview October 2011)

However, not all students and teachers could benefit from increased interaction opportunities, which is discussed in more detail in the following (see *Findings/The school and its culture/Challenges of blended teaching and learning*).

Improved quality of student work

The study of the embedded case also illustrated another advantage of blended approaches; using alternative media instead of paper and pen was an easier way for the students to create good quality work, as argued by Teacher 6 and the students themselves. This advantage was only mentioned by Teacher 6 and not other teacher participants. An explanation could be that improving the quality of student work was one of the main goals of Teacher 6, as discussed previously (see *Findings/The school and its culture/Teacher participants and their vision*) and therefore, he had an increased focus on this particular aspect. As Teacher 6 explained, using online tools and being able to share their learning, made it easier for students to improve the quality of their work:

"It allows kids to do nice looking work, relatively easily and also the idea was that they would then start being proud of their work and semi publicly displaying it [makes online tools useful for student learning]." (Teacher 6, interview September 2011)

For example, all students created a graph for one of their Science experiments, where they showed the melting and boiling points of water and sulphur. As one of the students commented:

"The graph has more detail, but when you draw it doesn't look that special like in the computer; it's easier than drawing." (Student 3, interview September 2011)

All students also, created a presentation to explain the method and results of an experiment, where they tested several substances carbohydrate (or lack of it), instead of writing the experiment description on paper (see *Figure 12*). The teacher explained his approach:

“You don’t have to write down observations anymore, you can just have a little video of what happened [...] you don’t have to draw a diagram of the equipment, you can just take a photo of the equipment.” (Teacher 6, interview September 2011)

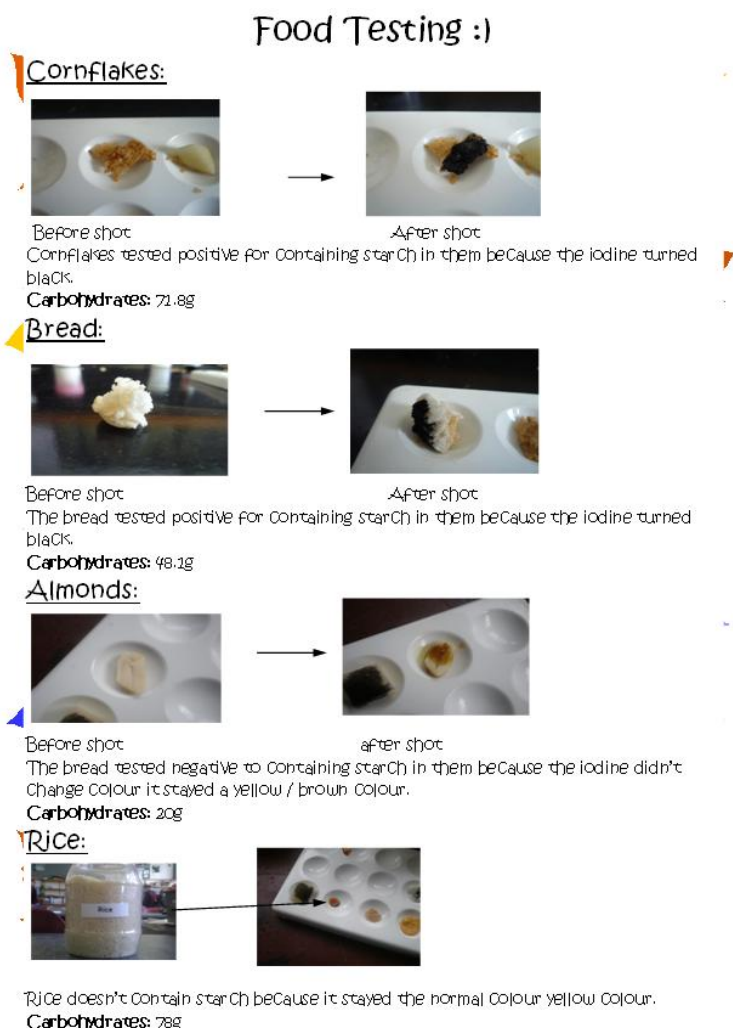


Figure 12. Presentation on MS Publisher created by Student 2 and embedded in an ePortfolio page (September 2011)

Teacher 6 also explained that some students enhanced the quality of their writing, as they were encouraged to reflect on their learning. As Teacher 6 wrote in his literature review for his postgraduate course as part of the BTLPD, reflective thinking needs to be a key characteristic of effectively using ePortfolios with the students, in order to enhance student learning (Teacher 6, literature review on ePortfolios in education, March 2011). The teacher was willing to help students to develop their reflective thinking skills and he used various strategies to achieve that. Although reflecting was a challenge that most of the students faced in the class owing to their low readiness for blended learning (see *Findings/The school and its culture/Challenges of blended teaching and*

learning), at some levels, the students began to develop reflective thinking skills, improving the quality of their writing (see *Figure 13*):

“Having read through the students’ posts yesterday, there are a few that are beginning to critically reflect.” (Teacher 6, reflective journal on VLN portfolio for BTLPD, May 2011)

Student 4 explained how she made progress, by increasing the length of her writing, as she was encouraged to further reflect on her learning (*Figure 13*):

“At the start we were writing blog entries and we were writing like 2 sentences long. And then, as we thought about what we had to do more in a subject and what we needed, we started writing more. It made us think more about what we have to write.” (Student 4, interview October 2011)

ePortfolio by

:

Blog : Science presentation

Science presentation

I think that i did well but i think that i could of answered the questions better by asking for help

Posted by on 24 March 2011, 2:46 PM

Feedback

0 comments

[Place feedback](#) |
 [Report objectionable material](#) |
 [Print](#) |
 [Add page to watchlist](#) |
 [i](#)

ePortfolio by

:

Blog : Report comment

Report comment

I think that I have been working really well this year by completing posters, powerpoints to a good standard. One thing that I could improve on is to not talk as much in soft materials. The subject that i am doing well in is sos. Because i have been recieving excellence for most of the projects that i have been handing in. The subject that i could improve in would be maths. Because its harder work and to interpret the infomation so quickly.

Posted by on 08 June 2011, 10:24 AM

Feedback

Great report comment , I've just read the other comments from your teachers, and they all agree, you are doing very well. 😊

08 June 2011, 8:34 PM

1 comment

[Place feedback](#) |
 [Report objectionable material](#) |
 [Print](#) |
 [Add page to watchlist](#) |
 [i](#)

ePortfolio by

:

Blog : Last year 9 post

Last year 9 post

School is nearly finished and its now time for summer holidays! 😊

This year has gone really fast, and on the way we have learnt new things, topics. my favourite topic that i had would be pe as we did really fun activities such as basketball, soft ball. The team that i was in for basketball "skux" was really good as we worked together and ended up winning that competiton. We are now in the middle of baseball and i am finding it really fun, i can catch the ball!

I also enjoyed food as we made lots of yummy food e.g pizza, breads, cheesy meal, cheese cake. i have learnt lots of new skills that are needed for cooking, and good hygiene skills.

Posted by on 07 December 2011, 11:04 AM

Figure 13. Student 4 reflections increased in length overtime (March-December 2011)

Encouraging parental involvement

For those teachers who were using online tools that parents could access, such as ePortfolios (Teachers 4 and 5), a perceived advantage was the opportunity for the parents to be more involved in the students' learning. This was also mentioned by the ePrincipal who argued that with the use of blended approaches, especially with ePortfolios, parental involvement is increased, as home-school connections can be strengthened, because parents

"...see what is going on and evidence of learning getting involved." (ePrincipal, interview October 2011)

Giving an example of building stronger home-school relationships in the Year 8 homeroom class, Teacher 4 said:

"With the portfolio pages, where they are doing their reflections, I've recently set up my own pages for parents. I was really surprised how well parents have responded to that, even in the last week I had someone saying that it's really nice to know what students are learning."
(Teacher 4, interview September 2011)

Teacher 6 in the embedded case also encouraged the students from an early stage to share their ePortfolios with their parents. Some students (e.g. Students 2, 3 and 4) did mention that they often shared their work with their parents, as well as teaching them some of the ICT skills they were developing at school. However, at the end of Term 4 the teacher was not able to evaluate the degree to which parents were involved in student learning, as he had limited feedback from them:

"I have heard very little feedback from parents accessing the site." (Teacher 6, reflective journal on VLN portfolio for BTLPD, December 2011)

4.2.7. Challenges of blended teaching and learning

Teacher participants and the school principal also talked about a range of challenges that they, or the students experienced at the beginning, or later, throughout the implementation of blended approaches. Some of these challenges were also confirmed by data from the embedded case study of one Year 9 blended web-enhanced class. Similarly to the advantages described above, the presentation of the challenges is thematic, based on the primary (interviews with the participants) and secondary (observations, document analysis) sources of data, beginning from the main case, followed by results from the embedded case study where relevant.

Limited access

Almost all participants talked about challenges with access to computers and/or internet, at school and/or from home.

a. Access at school

The school principal argued that access issues at school prevented teachers from seamlessly blending online with face-to-face teaching approaches within their courses. Although the school had recently upgraded most of its ICT (see *Findings/The school and its culture/Blended teaching and learning at the school*) this was not enough to allow teachers to use ICT in a convenient and seamless way. For example Teacher 3 commented that:

“I need to be able to make sure I’ve got access to the resources, to the computers when I need it. There will be other people needing them, so, I’ll have to book the computers for a specific time.” (Teacher 3, interview September 2011)

The school's internet connection was also a part of access issues, being in a rural area:

“The blending has to be a lot more natural and fitting more with what’s needed... in terms of making it part of what we do every day. It’s still pretty much an extra on top. [...] At the moment we couldn’t - we don’t have enough wireless... we just don’t have the infrastructure.” (School principal, interview May 2011)

The views of the school principal and teachers about limited access were also reflected in the ePrincipal's comments about some rural schools' low readiness to implement blended teaching and learning, owing to access issues:

“There’re some of our schools, especially the small ones where there is very little going on. But some of it comes down to their internet connection, which is really poor, but that all will be fixed really soon [because of the UFB initiative for schools].” (ePrincipal, interview October 2011)

Participants in the embedded case did not talk about issues related to computer access at school as other teachers did. A possible explanation could be that Teacher 6 managed to book one of the school's computer rooms for the whole year for one period per week.

However, student participants talked about internet access issues at school expressing their frustration when they worked in the computer lab and the internet speed was not fast enough for all of them to use their ePortfolios at the same time. This was also confirmed several times during the observations in the classroom:

“When you download something and it takes a very long time and you have to do other things. Then you have to go back to it but it’s still loading...” (Student 4, interview October 2011)

“Another girl was trying to add a text box in her ePortfolio, so that she could comment on her Science graph. Her computer was too slow and often everything would freeze. She was obviously impatient, laying her head on the desk. She was expressing her indignation by constantly saying “Come on, come on!” (Observer's notes, visit 6, September 2011)

b. Access from home

The teachers also talked about challenges to access from home, which caused additional barriers not only for them, for their own planning and preparation, but most importantly for the students, who were not always able to access their blended web-enhanced courses from home. For example, Teacher 4 commented that:

“Ten percent [of my students] don’t have regular [internet] access at home. I thought that it might be just one or two - I was quite surprised.” (Teacher 4, interview September 2011)

Slow internet speed from home was an important challenge that both Teacher 6 and student participants in the embedded case talked about. For example, most students had access to the internet from home through dial up connection. Student 1 commented:

“Sometimes the things on your computer at home won’t work and then at school they will.” (Student 1, interview September 2011)

Focusing on the embedded case, an interesting comment by one of the students was that computer access from home is very important to succeed in a blended web-enhanced course, as they can practise more on the challenging aspects in their own time:

“If you get a computer of your own you know what to do. [...] Practising at home.” (Student 1, interview September 2011)

Similarly to other participants in this study, Teacher 6 expected that fast broadband internet connection would enable more seamless implementation of blended web-enhanced teaching and learning. For example, the teacher said:

“I think high speed internet access at home is a really important thing and broadband at home. Kids are on dial up... the difference between dial up and broadband isn’t just the speed, it’s the way that you use things.” (Teacher 6, interview September 2011)

Student readiness for blended learning

Student readiness to learn in a blended environment was an important challenge, especially in terms of learning independently, confidently and effectively interacting online, as well as understanding the usefulness of the implemented practices.

a. Learning independently

Although most teacher participants agreed that with blended approaches students develop independent learning skills, student ability to self-direct their learning was an important challenge they identified. For example, the teachers who were already implementing blended web-enhanced courses (e.g. Teachers 2 and 5) observed that their students' independent learning skills varied. Similarly, Teacher 3 who planned to implement a blended web-enhanced course the following year expected that the students who would use Moodle as their main learning environment, would need to be independent enough to self-direct their learning with minimal guidance. As he noted:

“That will depend on the individual, how well they can do this and manage themselves [...] There are students who can do that, but there are students who struggle with that.” (Teacher 3, interview September 2011)

In terms of blended distance courses, the eDean (Teacher 1) explained that the school assessed student independent learning skills and prior knowledge before their enrolment in the VLN courses. He noted that this procedure was beneficial for the students themselves, especially those who would be highly likely to struggle. However, Teacher 2 remarked that her Year 11 distance students were not always mature enough to self-direct their learning and they needed further support in developing independent learning skills:

“Very often we assume that they will cope [...] I find that almost the majority of my students are really struggling [...] They are not mature enough yet.” (Teacher 2, interview October 2011)

From his position as the eDean at the school, Teacher 1 explained that the role of the eDean is very important in supporting students during their self-study times at school when they are not meeting virtually with the teacher. However, Teacher 1 and Teacher 2 explained that depending on the school, their students in their blended distance courses received different levels of support from their own school:

“The only support they have in their school is the eDean and some of them try really hard to support the students and make sure they provide them with all the resources they need. Some of the eDeans are not like that. [...] Clearly you can tell which schools are supporting their students more than others.” (Teacher 2, interview October 2011)

In the embedded case, students' ability to learn independently in the blended web-enhanced class varied, with some students facing more difficulties than others. During the observations, it was clear that student ability to work independently in class was influenced by the degree to which they could control their distraction. Some of the observed students seemed to be able to focus on their work, without distractions, either from the beginning or by progressively developing independent learning

skills (see *Findings/The school and its culture/Advantages of blended teaching and learning*). Others were more distracted:

“Two students were looking at some photos of animals that they searched on the web. Meanwhile they were editing their Voicethreads. They were changing between windows, depending on where the teacher was.” (Observer’s notes, visit 4, August 2011)

Sometimes, slow internet access increased student distraction for independent students, as there was more waiting time involved while they were engaging with their tasks:

“A group of three male students were working on their Voicethread presentations. One of the students was ‘lying’ on his chair and he was constantly changing between windows on the computer screen, as he was waiting for his photos to be uploaded.” (Observer’s notes, visit 4, August 2011)

Teacher 6 shared his view on the reasons students prefer being taught directly rather than working independently, expressing his concerns regarding student willingness to self-direct their learning:

“...they kind of revolt against it, it’s much easier for a student to come into a classroom and be told what to do – be told what to think.... than to be accessing the stuff themselves.” (Teacher 6, interview September 2011)

Student participants did not directly confirm Teacher 6’s argument; however they all talked about their need to be provided with clearer directions in class in order to work independently, with some requiring more onsite support from the teacher than others. For example:

“The teacher just has to expand and explain more some stuff. After that I can do it myself anyway.” (Student 3, interview September 2011)

“I found it difficult to learn because... when the teacher says to do one thing they’ll do it and I get left behind and then it’s the same at home...” (Student 1, interview September 2011)

Student 5 explained that although she was able to work independently most of the time, she often needed the teacher’s confirmation to proceed with her tasks:

“I always double check with the teacher. [...] Because you may understand it but not be sure if that’s the right task - that’s probably the problem that I get sometimes.” (Student 5, interview October 2011)

The students added that learning independently was challenging for them because of time constraints. For example:

“You don’t really have enough time – you had a busy day and you go on the computer straight away.” (Student 2, interview September 2011)

“I am away [after school] for four days a week, I don’t get home till 10 o’clock. As soon as I get home I am back in the car.” (Student 3, interview September 2011)

The teacher talked about the need for a balanced type of blend that respects students' time after class time and school hours:

“We are asking the kids to do quite a lot more at home. [...] I don’t really want them to be going home and having 2 or 3 hours worth of sitting in front of a screen time.” (Teacher 6, interview September 2011)

b. Interacting online

Teacher participants who were teaching blended distance courses talked about the challenging aspect of students not feeling comfortable interacting online with their eTeacher or classmates, beyond the one hour of video conference. Before the beginning of the blended distance courses, the students from areas across New Zealand, met face-to-face with their eTeachers and the rest of the students, with the opportunity to start building a relationship. Teacher 2 argued that during the year her students were not comfortable enough to communicate with her online asynchronously for questions and/or support beyond the one hour of video conference:

“I think the kids are often feeling very lonely. I only have them once a week. [...] it’s not that easy when you actually have to put your question into an email and wait for the reply and things like that.” (Teacher 2, interview October 2011)

The eDean (Teacher 1) explained that the need for more student-teacher interactions in blended distance courses was greater than in face-to-face courses:

“At the beginning of the year I told students that if I don’t hear from them I don’t know what they are doing or what they are thinking.” (Teacher 1, interview September 2011)

Teacher 1 noted that, because the nature of his blended distance course made the need for student-teacher interactions even more important than in a face-to-face classroom, he used text messaging with his students as a means to communicate after class time and school hours. As he explained:

“Certainly I don’t do that with my [face-to-face] school students, because... I don’t know how it would go really! But it’s the way of the future. I think using their cell phones is really interesting.” (Teacher 1, interview September 2011)

He commented that although his students were confident enough to interact with him during their self-study through email or text messaging, being able to contact the eTeacher using synchronous communication tools (e.g. Skype) would give students more instant access to the teacher and would make their communication more effective.

For Teacher 1, building up student relationships with one another was equally important, but yet rare, as they were based at different schools. He suggested that meeting face-to-face with the students more than once a year would be very useful for them to feel more comfortable interacting with one another, which in turn would help them to take more responsibility for their learning:

“It will be quite nice to think that we can have one or two days throughout the year when we all get together [...] to talk more to each other [...] Because there are some very bright kids in the class that [...] once they’ve learned the topic they are able to help some of the others.”

(Teacher 1, interview September 2011)

Teacher 5, who was teaching in a blended web-enhanced Year 7 class, pointed out a different communication challenge, arguing that students often do not know how to interact effectively online. The teacher observed that her students often overused some aspects of their ePortfolios, by using them mostly for social networking rather than learning.

Observations in the embedded case, indicated Year 9 students’ preference for using short messages to interact with one another in their ePortfolios (see *Figure 14*).



Figure 14. Students using short messages to interact in their ePortfolios (from Student 6's profile page, April 2011-September 2011)

Teacher 6 in the embedded case expressed his concerns regarding students' online communication and the practices he could undertake to help students become more confident to communicate online asynchronously, using longer sentences. For example:

"I'm thinking that much of the struggle is trying to teach students how to communicate. We tried to reply to forum posts from the BTLPDers [other teachers involved in the BTLPD] who visited us two weeks ago. The students had difficulty in thinking what they could say. I think they are too used to writing very short "chat" messages and find it difficult to think beyond one or two sentences." (Teacher 6, reflective journal on VLN portfolio for BTLPD, June 2011)

c. Understanding the purpose of blended approaches

Students' difficulty in understanding the purpose of several blended learning activities was not reported by all teacher participants, but it was apparent through the study of the embedded case. Teacher 6 noted that students often had difficulty in understanding the rationale and aims behind some of the implemented practices, although the students generally enjoyed learning in a blended environment. For example, the Teacher 6 commented that generally:

"... [Students] should develop a "Why do I want to do this" skill. [...] It is the reasoning behind this, what was the purpose of putting Science work online? Why am I putting my home work online? What's the advantage of doing this?" (Teacher 6, interview September 2011)

Through the student interviews, some of the students expressed their frustration regarding certain activities, such as the benefits of having an ePortfolio and reflecting on their learning:

Interviewer: So you can see what you did. But how does this help your learning?

Student 1: It's hard that question...

Student 3: The teacher wants you to write it all down and put it on there. So you find that once and then you do it again.

Student 2: I don't know why...

(Students 1, 2 and 3, interview September 2011)

Some of the students developed reflective thinking skills and the improvement in the quality of their work was clear from looking at their blog posts from the beginning to the end of the implementation (see *Findings/The school and its culture/Advantages of blended teaching and learning*). However, not all students showed the same growth and for some of the interviewed students reflecting was the least enjoyable activity and they could not understand how it could enhance their learning. The teacher acknowledged that students could not fully understand the value of reflecting, owing to their low levels of readiness and maturity:

“It’s a very hard skill and it’s not something I think that comes easily to Year 9 students, nor anyone else – but year 9 students definitely not.” (Teacher 6, interview September 2011)

Another example of student inability to understand the usefulness of several activities was apparent through the observations when, during the 5th week of Term 3, Teacher 6, aiming to help students to improve their ePortfolio pages, asked them to provide some feedback on each others’ ePortfolios. Some students had realized the different purposes of a profile page and an ePortfolio page, while others had not developed this understanding:

“One of the students, while looking at another classmate’s ePortfolio page explained to me: “It has too many images... Well, it’s ok if he wants to put them in his profile page, but not in his portfolio page; because the portfolio page is to show your learning, not irrelevant images.” (Observer’s notes, visit 5, September 2011)

Teacher 6 explained that at some level, student difficulty in understanding the usefulness of ePortfolios was normal, as both the teacher and the students were still at an exploration stage, discovering new aspects and potential advantages of blended learning. Teacher 6 often discussed with the researcher ways he could improve this, acknowledging his important role in addressing this issue. For example:

“Teacher 6 was also concerned that some students added titles on the photos they uploaded on Voicethread to present their experiment and others didn’t; he explained to me the reasons for asking them to do that [...]. He thought that it could be a good idea to explain these reasons more clearly to the students too, to help them better understand what they are doing and why they are doing it.” (Observer’s notes, visit 4, August 2011)

Capacity building among teachers

Another key challenge that the school faced with blended approaches was the potential to build capacity among teachers, especially in terms of using teaching in a blended environment with adequate pedagogical underpinnings. This was challenging for various reasons:

- a. Increased time demands

For most teacher participants managing increased workload demands and self-training was difficult at the beginning, but as they were getting more experience with blended teaching these challenges were minimized. For example:

“I think that although for the first couple of years there were negatives with a lot of time and involvement, now it’s getting a lot easier and I am freeing up my time.” (Teacher 5, interview September 2011)

Teacher 4 explained how using VLN portfolio for the first time, placed additional challenges on her increased workload:

“I definitely did [find some challenges] in being able to keep up, especially with doing the portfolio sites in VLN. I’ve only started working at the school last term and I’ve never used it before, so it was new for me. The challenge for me was actually having my own skills.”

(Teacher 4, interview September 2011)

This was also something that the ePrincipal and school principal found to be challenge for most teachers, which is normal with any innovation, according to their view. The school principal also noted that for some teachers, their limited familiarity with ICT and speed of change posed additional challenges and time demands, as they had to keep up and at the same time teach effectively with new approaches:

“The technology is changing so rapidly that you can’t just be satisfied with [for example] having a laptop and learning how to use Word. [...] Now there’s a whole range of new tools out there. So, for an individual to keep up with that and try to assess the things available that should be included or not, is very difficult.” (School principal, interview May 2011)

Teacher 6 of the embedded case also confirmed challenges in managing the increased time demands related to the implementation of ePortfolios in his class, especially being able to monitor student activity after class time and school hours. This was something that the teacher did not report in using Moodle, as it is a different tool that requires different involvement from the students:

“Keeping up with marking their work or even just looking at their work [is difficult]. [...] Suddenly in Terms 1 and 2 I was more available with their work and to make some comments on it. But at the end of Term 3, time is just a bit limited for everybody.” (Teacher 6, interview September 2011)

b. Teacher attitudes

The school principal commented that although some teachers were comfortable experimenting with new tools and approaches, there were still some teachers who were very resistant to change, owing to their attitudes towards blended teaching and learning:

“You are trying to change peoples’ ways of doing things and as I said teachers are remarkably resilient as a group to big changes.” (School principal, interview May 2011)

Some of the teachers also expressed their concerns regarding involving more teachers in blended teaching, based on their observations with other staff members at the school. For example:

“It’s good to have the ePortfolio pages with the kids, they’ve got their own profiles, they’ve got their own reflections, but are they going to be able to continue [using their ePortfolios] next year? It depends on who the teacher is.” (Teacher 4, interview September 2011)

Some of the teachers suggested that through enhanced collaboration between teachers and training, there is a greater potential to build capacity among teachers and lead to more widespread adoption of blended teaching and learning. For instance, Teacher 5 shared some examples of her informal working together with teachers who were interested in her blended teaching approaches. She added that:

“If there were more teachers that were keen on this type of approach, working together... It would be great if I could pass this [Year 7] class to a class in Year 8 where they would have such an ICT rich environment.” (Teacher 5, interview September 2011)

Low involvement from other teachers was confirmed as a challenge in the embedded case as well. Teacher 6 implemented ePortfolios with his Year 9 students as a form class activity at the beginning, expecting that students would be able to share and reflect on their work from more classes in addition to their Science class. However, there was little involvement from other teachers, which provided additional barriers for the teacher in effectively implementing ePortfolios:

“The idea was that it wasn’t a really Science thing, it was a form class thing and we were trying to reflect on stuff from other lessons as well, we put stuff from all other lessons. But I found it difficult to get them get digital content from other classes. [...] I guess at the moment it’s just me pushing this for us.” (Teacher 6, interview September 2011)

Teacher 6 had conversations with other Year 9 teachers during the year, to encourage them to take part in developing students' ePortfolios, but, as he reported in the interviews and his online reflection blog for BTLPD, this was not enough to engage them. Some students talked about using other tools in previous years (e.g. Wikis), but commented that most of their involvement with blended learning took place in their Year 9 Science class and they expected to use more online tools in other classes as well. Student 5 suggested in particular:

“It would be good if we could have the portfolio and calendar that our teachers use in all subjects [...] not just the 2-3 doing it.” (Student 5, interview October 2011)

Low involvement from other teachers encouraged Teacher 6 to focus more on incorporating ICT in his Science class, so that students would be able to upload and share their work, further reflecting on their learning in Science:

“I’ve got away from doing that evaluation, looking at what we’ve done, what we’ve enjoyed. Away from that it’s actually doing something and producing something so that they can actually see that if they put some time into this now, then they’ll make this look good.” (Teacher 6 interview, September 2011)

c. Teachers’ pedagogy:

The school principal further argued about the need to build teachers’ capacity, not only in terms of using blended approaches as an end in itself, but in terms of effective implementation with adequate pedagogical underpinnings:

“I don’t think we are at the point yet where we see big changes necessarily in the pedagogy, because of that [blended approaches]. [...] Some people on the surface look like they are doing stuff but really they haven’t changed in essence about what they do”. (School principal, interview May 2011)

Some teacher participants commented that up-skilling is an ongoing process for them and blended teaching requires different approaches in order to be effective. For example, the eDean, Teacher 1, said that, despite the manageable number of students (ten students) in his blended distance course, and although he always tried to encourage all students to actively participate in each video conference session, it was still difficult to ensure that all students’ needs were addressed. Teacher 2 also explained that teaching a blended distance course was different compared to teaching face-to-face:

“I’m still trying [since the beginning of teaching a blended distance course] to find the way to teach through video conference properly. I think that I kind of found my personal approach and techniques in my face-to-face class, but I don’t feel that I’m still that comfortable with the video conference.” (Teacher 2, interview October 2011)

Teacher 2 highlighted that becoming an effective eTeacher is even more difficult than teaching face-to-face, given the fact that students often came from various schools, and did not have the same background knowledge and experience with the content area.

In the embedded case Teacher 6 confirmed this type of challenge, especially in helping students understand the usefulness of blended learning as discussed previously in this section, as well as in using effective pedagogic approaches to support students to develop reflective thinking skills with the use of ePortfolios. Teacher 6 acknowledged from an early stage that his role in stimulating student reflection was very important. As he commented in his online journal:

“WHAT? When I looked at students’ posts about Science from last week, I tried to think what they might write for their “So What?” comment. I realised that I’ve not necessarily been teaching - So What? for the subject matter we are covering.

SO WHAT? Not teaching So What? in my lessons makes them not relevant to the students.

NOW WHAT? I need to try and add a “So What is the importance of this?” to my plenary. It would be good to share this in a Science meeting.”

(Teacher 6, reflective journal on VLN portfolio for BTLPD, May 2011).

Teacher 6 explained that the complexity of effectively teaching students how to develop reflective thinking skills, in conjunction with student immaturity and readiness to reflect, as well as low involvement from other teachers in the whole process, often made him question the usefulness of changing his pedagogy and incorporating new skills, such as student reflection, rather than using blended learning to enhance their learning about Science:

“I have invested a significant time in this at the cost of their Science. Not sure that it has been completely worth it yet.” (Teacher 6, reflective journal on VLN portfolio for BTLPD, June 2011)

This was also confirmed during the observations. Before the beginning of the study, Teacher 6 explained to the researcher that enhancing student reflection was one of the key goals of his implementation of ePortfolios. However, student activities during the observations were mostly focused on their Science learning (e.g. using Voicethread to present their experiments, creating Science graphs, playing online Science games).

Parental support

Despite the advantage of strengthening home-school connections with the use of blended approaches, limited support from the parents was one of the challenges that some teachers faced. For example:

“I’ve got about five students in my class at the moment who are not allowed to use the computers at home, because their parents fear that they use them too much.” (Teacher 5, interview September 2011)

“The other challenge with setting stuff for them to do online at home is parental support, because a lot of parents contacted me thinking they are games.” (Teacher 4, interview September 2011)

This was also something that the ePrincipal mentioned, based on his observations in various schools across the cluster, arguing that parents often expect their children to be taught with the same traditional methods that were used when they were students:

“There’s also parents’ expectations of school and what it is like, it’s their own experience of it, so there’s a real challenge there as well.” (ePrincipal, interview October 2011)

Teachers explained that this issue often occurred because of parents' limited knowledge on how blended approaches could support student learning. As Teacher 4 suggested, support from the parents could be increased by giving them the opportunity to see for themselves what students learned and understand the potential of blended approaches:

“I think at the beginning that low student support [from parents] was because they didn’t know what the students were doing and because I didn’t necessarily approach it the right way and say “this is what we are doing and this is what it looks like”. [...] [After giving them access] It was a really good surprise to see that so many wanted to see even the stuff that we haven’t done online.” (Teacher 4, interview September 2011)

Although the study of the embedded case did not provide enough data to indicate any challenges regarding parental support, there was an interesting comment from one of the students, mentioning that her parents have some concerns about using computers for learning:

“They think it’s good but they don’t like the fact that it’s all going on to computers. Because if your computer breaks down or something, everything is gone.” (Student 2, interview September 2011)

However, in this embedded case study, there was little evidence of parents’ negative impact on the effective implementation of blended approaches. This does not necessarily indicate a positive impact from parents, as there was also limited data on increased parental involvement, compared to other teacher participants’ comments (see *Findings/The school and its culture/Advantages of blended teaching and learning*).

Usability of tools

The school principal noted that a range of different tools were used (e.g. Student Management System, Learning Management System, online booking system for resources, online booking system for parent interviews) and each tool required different skills from the teachers to effectively use it. He explained:

“I am looking forward to a time when the usability is easy, the reliability to pull together different things and they work together quite nicely. You don’t need to learn and have so much difficulty with learning how to do this particular thing.” (School principal, interview May 2011)

Some teacher participants (e.g. Teachers 2 and 4) also talked about usability issues, which were directly related to their limited time to explore new tools to their full potential, as discussed previously in the challenges section, focusing on teachers' capacity building.

Usability issues of the ePortfolio software further challenged Teacher 6 of the embedded case and his already busy workload, as written in his online journal. For example:

"[...] Another issue [with VLN portfolio] is that you can only edit your blog entry by following the steps above, and not directly from your view (page) or blog (Journal). This just makes it too tricky to edit and comment". (Teacher 6, reflective journal on VLN portfolio for BTLPD, May 2011)

Throughout the implementation, Teacher 6 mentioned several times his concerns regarding the usability of the ePortfolio software, based on his own and students' experiences:

"[One student] said 'Facebook is way easier than this'. Made me think that he was probably right. [...] This just makes it too tricky to edit and comment - surely something this is designed to do well." (Teacher 6, reflective journal on VLN portfolio for BTLPD, May 2011)

He often used time before or after class to explore aspects of the ePortfolio software that would make it easier for him and the students to use, as illustrated during the observations. For example:

"[After the end of the period] Teacher 6 was trying to find a way to get notifications for changes in students' ePortfolios. He asked me if I knew how to do this and unfortunately I couldn't help. He explained that it is very difficult going through student pages separately to look for changes himself." (Observer's notes, visit 3, August 2011)

During the interview, Teacher 6 noted that he finally found the way to monitor changes, which made it easier for him to provide feedback to students.

Student participants also confirmed usability issues, especially during Term 3, when some features of the ePortfolio software changed, causing frustration to students at that time:

"It just recently changed everything, adding different things. So that makes it difficult as well, but then we just follow what the teacher does and we get the hang of it after a while." (Student 5, interview October 2011)

4.3. Future of blended teaching and learning at the school

Despite the challenges, participants seemed to be optimistic towards the future of blended teaching and learning at the school. This was more evident from the school principal's point of view, as well as from comments by teachers who were planning to continue with blended teaching the following year;

for example the eDean, Teacher 1 (who planned to continue offering blended distance courses, with a particular interest in increasing student-student interaction and collaboration), Teacher 3 (who planned to experiment for the first time with Moodle in his senior Technology class), and Teacher 6 (who planned to continue using ePortfolios with his students, but also engage more teachers in learning about their use and implementation in their own classes).

The school principal expected that teachers' adoption of blended approaches would increase, as they became more familiar with ICT. He explained that the school will further encourage this, as:

"Now all our notices are online, all our bookings for all the resources are all online. So if a teacher wants to operate at the school they have to be interacting with the technology. [This is important] in developing comfort with that." (School principal, interview December 2011)

The school planned to improve the infrastructure with a fast broadband fibre connection, under the Ministry of Education UFBiS. The school principal expected that this will enable the school to implement an official policy for BYOD, encouraging the students to bring their own devices to school, such as small laptop computers. He further explained that this would encourage more seamless implementation of blended approaches:

"Once some of those issues of the technology are sorted then it will be a lot more natural... to fit the needs of the pedagogy. [...] And the cost of things like netbooks is coming down enough that it's getting to the point where it's not unreasonable to ask parents to get one. And our network with the upgrade we are planning will enable us to manage that." (School principal, interview May 2011)

The school principal added that the role of support staff, especially regarding technical issues, will be very important in order to sustain and more seamlessly implement the upgraded resources, by helping students and staff to easily use them:

"...what will hold us back is the way we structure ICT support in the school. Not PD support necessarily, but technical support [...] We need to have somebody with that expertise, that is really at hand just to work with students, work with staff..." (School principal, interview December 2011)

The school's plans for the future agreed with the ePrincipal's expectation that once infrastructure issues are sorted blended approaches will eventually bring change:

"Once we all get to fibre and start giving some capacity building in terms of the online side of things, I think that will make real change." (ePrincipal, interview October 2011)

The school principal also explained that after a couple of years of experimenting with a variety of tools, the school planned to become more directive in terms of the use of blended teaching and learning. This was something that Teacher 4 also suggested, who experimented with a variety of tools in her Year 8 Homeroom class, as using similar tools and working towards similar goals would further encourage teacher-teacher collaboration and capacity building.

“We need to take that next step and push it across everybody and say “this is what we believe is important now [...] Again, in a gentle way to begin with, but then try and build up those expectations, where we see that things are of value.” (School principal, interview December 2011)

In terms of further changes, the ePrincipal remarked that schools across the cluster were beginning to connect, especially Area schools (catering for students from Year 0 or 1 to Year 13) where there is less competition between schools. This has the potential to increase collaboration in the future, which was a big component of the e-Learning cluster's vision:

“It will take quite some time, but there is change happening... I look outside the cluster, there are different sorts of projects starting to develop.” (ePrincipal, interview October 2011)

He added that the cluster will continue supporting the use of a shared online environment between schools, in order to increase connectivity, explaining that:

“If schools use their own space, schools develop their own LMS, they just become silos again, they are disconnecting [...] I think we need to start connecting and opening these environments across sectors and across communities.” (ePrincipal, interview October 2011)

As the school principal confirmed, an initiative to facilitate capacity building was an upcoming collaboration of the school with the contributing primary schools, with a focus on students' digital citizenship. As he explained, as part of their involvement in the contributing schools' ICT PD cluster, during the last year of their ICT PD contract, the schools planned to work together in developing an ICT literacy curriculum for the students, in order to provide continuity between the schools and enable students to become proficient in their digital skills. As the school principal noted, collaboration between schools is achievable when schools are working towards common goals and the digital citizenship project would be the common goal that contributing schools in the ICT PD cluster would work towards achieving together.

In addition, Teacher 6 had begun to lead school wide adoption of ePortfolios, through engaging more teachers in using them for their own professional development, having observed and experienced the advantages and challenges in his own learning journey. As he noted:

“It’s best to learn how to use it as a user, before you use it as an educator. [...] So I’d like to do that with a year group and involve all the teachers, so that all the teachers know what an ePortfolio is and what you can do with it and why it is useful.” (Teacher 6, interview September 2011)

In his last online reflection for the year, Teacher 6 shared his first impressions of sharing his learning journey with other staff members from the school and inviting them to be involved in the following year's professional development with ePortfolios:

“Last week I had the opportunity of sharing my journey with ePortfolios as a way of recording my PD with the staff of [school name]. [...] The presentation seemed to go well. A number of staff have indicated their desire to use ePortfolios to record their PD and also some are planning to use ePortfolios with students in 2012.” (Teacher 6, reflective journal on VLN portfolio for BTLPD, December 2011)

Overall, all participants were optimistic toward the future of blended teaching and learning at the school, with the ePrincipal also being optimistic for the whole cluster. The ePrincipal expressed his concerns regarding challenges that might emerge, with the ending of the regional ICT PD contract at the end of the following year (2012):

“The challenge will be when that funding finishes – how we can continue that? Because resourcing and funding are always the big problems and challenges with schools. We’ll see...” (ePrincipal, interview October 2011)

However, he explained that through the regional ICT PD cluster and the BTLPD, there is great potential for increasing schools’ and teachers’ capacity building:

“If we can build some capacity across the cluster then we can actually make it sustainable and that’s something that can improve beyond next year without funding.” (ePrincipal, interview October 2011)

Chapter 5: Discussion

Introduction

The findings of this study illustrate the complexity of educational change with blended approaches, because there are multiple connected threads impacting on and being impacted by the process of change. For this reason, an ecological perspective is used to frame the discussion on the findings and answer the main research question: *How is blended teaching and learning implemented in a New Zealand secondary school?* Based on Davis's (2008, in press) arena of change, presented in the literature review, *Figure 15* presents a view of the school ecology and the multiple organizations and stakeholders that impact on/are impacted by the development of blended teaching and learning at the school. The ecological framework is also informed by Fullan and Stiegelbauer's model (1991) on the meaning of educational change that acknowledges multiple change agents (including teachers, students, school leaders, parents/community, and other educational leaders and stakeholders).

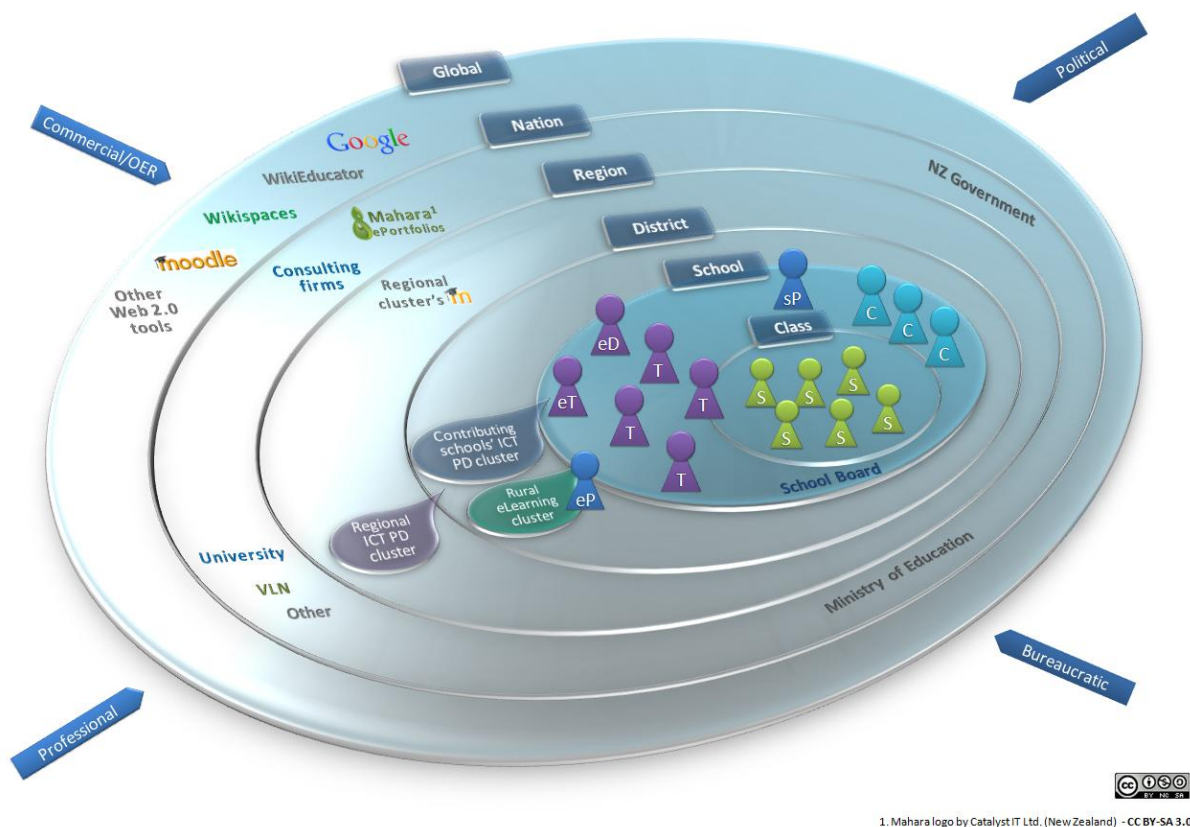


Figure 15. The ecological framework describing blended teaching and learning at the school (S: Student, T: Teacher, eT: eTeacher, eD: eDean, sp: school principal, C: Community/parents)

At the centre of the figure is the class, where blended web-enhanced or blended distance learning was implemented. The students and the teacher (or eTeacher in the case of blended distance courses) are in the centre of the class, impacting on/being impacted from the implementation of blended approaches.

This class is positioned within the rural secondary school, where there are additional teachers/eTeachers, one of whom is also the eDean, the school principal, as well as parents and other members of the community, who also have an impact on the development of blended teaching and learning at the school. The rural secondary school is placed within a wider district, region, national and global context, where professional organizations, such as the rural e-Learning cluster, the regional ICT PD cluster and the University involved in the BTLPD, the VLN and its community of schools are also part of the ecology in which the school is positioned. Bureaucratic organizations, such as the Ministry of Education, political organizations, such as the New Zealand government and its initiatives and commercial organizations (e.g. national/multinational companies and their products, OER), also affect the school's ecology. The way organizations and stakeholders are interrelated is now described, beginning from the class and then moving out towards stakeholders and organizations in the outer ecosystems in which the class is embedded.

5.1. The student

Beginning with the student, the findings in this study suggest that blended approaches had a direct impact on their learning experiences. Most teacher participants and class observations confirmed that blended approaches encouraged student-centred learning; as a result, the students developed independent learning skills, depending on their confidence, maturity and available support. Increased student independence has been reported as an important advantage of both blended web-enhanced and blended distance courses. Lee (2006) in particular, found in her research on online learning and cultural change in two primary schools in Hong Kong, that implementing an online environment in students' face-to-face classes gave students more time to work on their own, which encouraged them to develop independent learning skills. Bolstad and Lin (2009) found that students taking blended distance courses through the VLN acknowledged that they developed independent learning and other useful study skills that may be transferred in future learning contexts.

Moreover, the use of blended teaching and learning increased student engagement and motivation, as reported by students and teachers, and also confirmed during class observations. Ng (2008) found that when Year 7 students engaged with blended web-based learning, they often enjoyed activities that included a variety of media, such as images, audio, video and interactive elements. In this study, there was a range of factors that increased student engagement and motivation; some students preferred the independent style of learning, others were excited to learn new ICT skills and some enjoyed the social aspects of the online tools they were using. Increased engagement and motivation has been one of the advantages of e-Learning identified in Wright's (2010) literature review on e-Learning and implications for New Zealand schools.

The students also developed new ICT skills when they were working on the computers at school, exploring a variety of new tools. Other studies have shown similar findings, comparing students' ICT skills and confidence in an online and in a face-to-face class (O'Dwyer et al., 2007). Some teachers (e.g. Teachers 2 and 5) explained how students, who developed these skills while engaging with blended learning in their junior classes, were able to transfer these skills in their senior classes. Some students (Students 4 and 3) shared that they often taught these skills to their parents who were less familiar with computer use.

Flexibility was enhanced for the students, as they were provided with extended learning opportunities beyond school hours. This was particularly important when access to the school was limited, as Teacher 5 explained. The year 2011 was challenging for some areas in New Zealand, where disruptions by natural hazards (earthquakes, snowstorms, floods) affected many aspects of people's everyday lives, including access to schools. In this context, blended learning has been employed as a solution by many schools to increase students' and teachers' access to educational resources and adequate support (Davis, 2011b).

However, for some students, extended learning opportunities beyond school hours had further implications, owing to their limited access to computers and internet from home and/or time constraints. Although some teachers (e.g. Teachers 4 and 5) shared that students enjoyed working from home and completing online homework, Teacher 6 expressed his concerns about students' increased time demands, and some students from the Year 9 class (e.g. Students 2 and 3) commented on their inability to work online from home, owing to limited access and other obligations after school. Similarly, other studies have shown that students often face challenges with limited access from home (Cavanaugh et al., 2009), and they may lack time-management skills to address the new demands (e.g. Nicholas & Ng, 2009). This has direct implications for parents in providing adequate access and support from home, as well as for teachers in deciding the degree to which student learning will be extended beyond school hours, and in supporting students to develop time-management skills (see also *Discussion/The teacher*, *Discussion/The parent/community*).

Students in this school, in addition to the face-to-face courses that the school offered, could also enrol in blended distance courses offered through the VLN. Teacher 2 talked about her Year 11 blended distance course students; three of them were at this school, but they could only take the Year 11 French language course through the VLN, as there were not enough student numbers at the school to form a face-to-face classroom. At the time of the study, approximately ten students from the school were enrolled in blended distance courses through the VLN, mainly because of timetable clashes with face-to-face courses offered at the school. Other studies have shown that blended distance courses are often the only option for rural school students whose schools cannot offer a normal range of specialist subject courses (e.g. Bolstad & Lin, 2009; Pratt & Trewern, 2011a, 2011b).

Students' learning experience in the embedded case was enriched with a variety of resources, enriching the breadth and depth of student learning. Similarly, Parkes et al. (2011), in their study of the first blended course in a New Zealand high school, found that the quantity and quality of educational resources were increased with the implementation of an online learning environment in a Home Economics course.

In addition to being impacted by blended approaches, students also had an impact on the uptake and effectiveness of blended teaching and learning, as the findings in this study confirm. Fullan and Stiegelbauer (1991) argue that students are members of the school as an organization and therefore important stakeholders in the change process. "Educational change, above all, is a people related phenomenon for each and every individual. Students, even little ones, are people too." (p. 170). In this study, the school principal and some teacher participants shared that students often expect to use blended approaches in their classes, as they or their friends have experienced it in one class, and they often expected to engage with blended learning in other classes. Some student participants also confirmed their expectation to use ICT in more of their classes, as they enjoyed their Year 9 blended web-enhanced course. Based on findings in their large scale study on 4,000 middle grade students' attitudes regarding school, technologies and academic engagement, Spires, Lee and Turner (2008) argue that as students use ICT more and more in their everyday life, they expect to engage in learning activities that involve ICT at school. Similarly, in this study, all students talked about their everyday use of ICT for socializing or entertainment. Although they did not directly link this to their expectation to use ICT at school, this may be indirectly surmised, as they all agreed that they enjoyed working on the computers for their learning.

The role of the student is also important in encouraging parental involvement in their learning (Grant, 2009). In this study, some students' actions in teaching their parents the new ICT skills they were developing in their Year 9 class with blended learning, were a way to involve them more in their learning. However, there was not enough evidence to further indicate students' impact on parental involvement.

Student readiness to learn in a blended environment had also had a direct impact on the effective implementation of blended approaches, as reported by participants and also confirmed during the observations. Teacher 6 for example talked about students' difficulty in understanding the usefulness of some of the implemented activities and how this prevented him from effectively using ePortfolios in his Year 9 form class. This was also confirmed by some students themselves, who could not explain how the use of ePortfolios could improve their learning. Teacher participants also talked about students' difficulty in self-directing their learning or using higher order thinking skills, which directly impacted on that strategy. Interestingly, teacher participants talked about this challenge, presenting a range of difficulty levels, regardless of students' ages; for example, Teacher 2 had Year 11 students

who, according to her comments were not mature enough to self-direct their learning, while Teacher 5 talked about some, but not all of her Year 7 students who had no difficulty in learning online independently from home during the 2011 snowstorms. Student low readiness for blended learning was not an unexpected challenge, as this has been widely reported in the literature by previous studies on online/blended teaching and learning (e.g. Wright, 2010; Bolstad & Lin, 2009; Parkes et al., 2011).

The impact of students' learning experiences (positive or negative) on their attitudes towards online/blended approaches has been previously confirmed by other studies (e.g. Bolstad & Lin, 2009), illustrating the further implications for the role of the teacher and the parent in providing adequate support and facilitation to the students, as discussed later (see *Discussion/The teacher*, *Discussion/The parent/community*).

5.2. The teacher

The teacher is directly impacted by change with blended teaching and learning. In addition, the teacher, the keystone species in the education ecosystem (Zhao & Frank, 2003; Davis, 2008), has one of the most important roles in change with blended approaches, as "educational change depends on what teachers do and think" (Fullan & Stiegelbauer, 1991, p.117).

Blended approaches enabled teachers in this study to enrich their teaching with a variety of resources, depending on their confidence to experiment with new tools. Teachers' use of online tools varied from the incorporation of simple Web2.0 tools in the face-to-face environment, to the implementation of digital portfolios and to online learning environments. Furthermore, not only students, but also teachers benefited from flexibility, as for example those who were using blended web-enhanced approaches could work with different groups of students (e.g. Teachers 3 and 5), to better address students' diverse needs.

Blended approaches changed the role of teachers, who were encouraged to move away from their traditional role of being the centre of the instruction, towards facilitating student-centred learning. As the school principal explained, the degree of change depended on teachers' attitudes and their curriculum area, confirming that teachers are not only impacted, but also have an impact on change with blended approaches. Some teachers were willing to experiment with new tools and approaches and others were not. In addition, the practices that teachers undertook to implement blended teaching and learning in their classes were not always innovative, as the school principal and the ePrincipal noted. This was not an unexpected finding, given the range of literature discussing the issue of using ICT to sustain, rather than to change practice (e.g. Christensen et al., 2008, Gilbert, 2005). In the New Zealand context, Bolstad and Lin (2009), reviewing students' experiences in virtual classrooms, found that most video conference lessons were teacher rather than student-directed, while students were

encouraged to use ICT mostly for information retrieval and searching, rather than for authoring, sharing or conveying their learning.

The school principal explained that in some subjects traditional approaches have always been effective and therefore blended teaching would be most likely to be implemented as a sustaining innovation. This was also confirmed by Teacher 6 who argued that for Science, there are several limitations to the degree to which students can learn independently. Based on the findings of the Second International Information Technology in Education Study 2006 (SITES 2006), Law (2009) investigated the relationship between ICT and pedagogical practice in mathematics and Science classrooms. What she found was that in these curriculum areas, the educational use of ICT is usually traditional, although some teachers also focus on goals related to lifelong learning and connectedness. Law (2009) further discusses the implications for teachers' professional development, recommending a greater focus on the pedagogical, rather than the technically oriented aspects of ICT use in the classroom.

Teachers' needs for adequate professional development were further increased, because of their own and their students' changing roles. Scholars have argued about the important role of the teacher in effectively implementing blended approaches (e.g. Davis, 2008; Frailich et al., 2007), taking appropriate pedagogic decisions to enable students to benefit from the advantages, such as those found in this study, and to address the challenges. For example, in this study teachers could assign students online work after school hours, but this was challenging for students with limited access from home and other time demands. This illustrates the implications for teachers who need to ensure that the degree to which students are required to engage with blended learning at their own time and place (e.g. at home), is commensurate with their access and available time. Teacher 5 for example, explained that for students with limited access from home, she provided more opportunities to use the class computer. Similarly, in their study on junior secondary students in Australia and their engagement in open online learning, Nicholas and Ng (2009) suggest providing students with opportunities to engage with online learning at school, to help students manage their competing priorities and have adequate access to resources. Of course, this requires adequate access to computers and internet at school, which was not always achievable, as discussed in the following section, directly implying the important role of other educational leaders in providing sufficient infrastructure (see *Discussion/The school leader*).

Student low readiness to learn in a blended environment also had implications for teachers, who needed to be adequately prepared to teach students through blended approaches and to effectively support them. Nicholas and Ng (2009), argue that when introducing secondary students to online/blended learning that involves student-directed approaches, it is important to provide them with adequate support to gradually familiarize themselves with this different learning approach. In this

research, Year 9 students' comments on their ability to learn independently confirm this argument, as they pointed out that regardless of their readiness, teacher guidance and clear directions, especially directions given online, were very important in facilitating their development of independent learning skills. In addition, both eTeachers talked about the important role of the eDean in supporting students in blended distance courses, whose success depends on their ability to manage themselves, self-engage and learn independently.

However, as some teacher participants explained, capacity building, including learning how to effectively implement blended approaches and supporting students was one of the most important challenges that teachers faced, not unexpectedly given the number of studies showing similar results (e.g. Parkes et al., 2011; Ward, 2008). Teacher 1 for example explained how addressing all students' needs in a blended distance course was different from and more difficult than teaching in a face-to-face class. Although teacher participants shared that they were willing to *walk the extra mile*, some of them (e.g. Teachers 2 and 4) talked about their concerns regarding effective professional development in conjunction with increased time demands and busy workloads. Of course, this further impacts on the decisions of school leaders and other educational stakeholders, who have to address teachers' increased needs for professional development in order to effectively undertake their new role and support students, as discussed later (see *Discussion/The school leader*, *Discussion/Professional, bureaucratic, commercial and political organizations*).

5.3. Other teaching staff

Before committing to a change effort, it is important for teachers to consider whether other teaching staff at the school are likely to support or reject the innovation (Fullan & Stiegelbauer, 1991). Sherry and Gibson (2002), describing teachers' learning/adoption trajectory regarding ICT, present five stages through which teachers learn to use ICT educationally: teacher as learner, teacher as adopter, teacher as co-learner, teacher as reaffirmer or rejecter and finally teacher as leader. During all stages, teacher collaboration is important, but even more necessary at the third (teacher as co-learner) and fifth stage (teacher as leader), where teachers share their experiences and knowledge with other colleagues, inspiring one another through discussions, workshops they lead themselves or peer coaching.

The support of other teaching staff also had an important role in change with blended approaches in this study; for example, Teacher 2 talked about her collaboration with Teacher 1, the eDean, who was more experienced with blended distance teaching. Teacher 5 commented that she often shared with other teachers her blended teaching experiences, helping others who were interested in implementing similar approaches.

Zhao and Frank (2003) argue that professional development provided at the teachers' own school can be more effective than PD offered outside the school context. In their literature review on online communities of practice, Lai, Pratt, Anderson and Stigter (2006) explain that "Communities of practice are central to effective teacher professional development. [...] Communities of practice allow teachers to act as co-producers of knowledge, which requires greater personal responsibility for professional growth." (p.22). Teachers were encouraged to engage in professional development in this school, working in communities of practice. They were forming along with other teachers interest groups that worked together towards developing their knowledge and skills, sharing their experiences and suggestions. Apparently, teaching staff's attitudes and willingness to engage in this form of professional development impacted on their and other teachers' capacity building.

The opportunity teachers also had to engage in professional development at their own school (e.g. the Moodle group) led by themselves was a valuable way to share their experiences and knowledge with blended approaches. Teacher 6 engaged in professional development through the regional BTLPD, which also encouraged him to share his enthusiasm and knowledge with other staff at the school. For this teacher, collaboration with other teaching staff was not restricted to teachers from this school, but also with colleagues from other schools involved in the regional BTLPD. The school principal explained that this teacher's efforts in involving more teachers in blended teaching and his future plans to lead an ePortfolio professional development group, have a positive impact on the uptake of blended approaches at the school, illustrating the importance of community building among teachers and the need to encourage sharing of knowledge and experiences.

Some teacher participants and students shared their concerns with regard to other teachers' involvement with blended approaches, as the adoption of blended teaching and learning was not yet widespread. Teachers 4 and 5 for example talked about the potential of engaging more teachers in teaching through blended approaches and the benefits this would have for student learning, as well as for teacher capacity building. They also commented on the need for other teachers to commit to ongoing professional development, working together in groups with other colleagues within the school, sharing best practices and supporting one another. The role of school leadership in encouraging this culture is essential, as discussed in the following (see *Discussion/The school leader*).

In this study, the important role of the eDean in supporting students who were enrolled in blended distance courses was also evident. Teachers 1 and 2 however noted that the support students received from their home schools varied, therefore impacting on the effective implementation of their blended distance courses. The e-Learning cluster's web page provides a variety of resources to schools and teachers interested in or teaching through the VLN, including information and guidelines on the role of the eDean (see also *Discussion/Professional, bureaucratic, commercial and political organizations*). Research on students' experiences in virtual classrooms in New Zealand (e.g. Bolstad

& Lin, 2009; Pratt & Trewern, 2011b) confirms that the support students receive from their home schools varies. This illustrates the direct impact of other teachers' attitudes and school cultures on the effective implementation of blended approaches, implying the need for stronger connections between schools and teachers, as well as a development of a shared vision inculcated through schools' involvement in the e-Learning clusters or VLN community (see also *Discussion/Professional, bureaucratic, commercial and political organizations*).

5.4. The school leader

Fullan and Stiegelbauer (1991) argue that educational change does not only depend on teachers' attitudes and practices, but also on the school principal and other staff in the school's leadership team. The importance of school leadership was one of the key findings in the pilot study, prior to this research (Parkes et al., 2011), which led the researcher to research school leaders' attitudes and experiences regarding blended approaches as well.

In this study, the ePrincipal explained that, regardless of what teachers do, the role of the school leadership is essential in supporting teachers and stimulating change with blended teaching and learning. In her article on the need for visionary leadership, Davis (2011a) argues that “essential professional and organisational development is dependent upon the engagement of school leaders. However, too many school leaders do not have enough knowledge of ICT-enabled 21st century learning” (p.178). In this study, the school principal had a very positive attitude towards blended teaching and learning, considering at the same time the importance of effective pedagogy, rather than the use of ICT as an end in itself. The school leadership's attitude of encouraging experimentation with new tools, rather than dictating the use of specific tools in classrooms, as well as encouraging teachers to create their own professional development groups (e.g. Moodle PD group, ePortfolio PD group) illustrate the openness and supportive character towards change and different approaches.

As Riel (2009) argues, most schools encourage collaboration between teachers at their own school, but few take the next step and support teacher engagement in networks outside the school walls. This was also a concern that the ePrincipal talked about, as what he often observed was that schools were working in silos. The school principal in this study seemed to acknowledge the importance of sharing skills and knowledge, not only between teachers at the same school, by encouraging teachers to form communities of practice, focusing on common goals and sharing their experiences, but also between teachers from different schools. He supported the school's involvement in the regional ICT PD cluster and the BTLPD, as well as the school's active participation in the contributing school's ICT PD cluster and the project to increase students' digital citizenship.

In addition the role of the school leadership is very important in providing teachers and students with adequate infrastructure. In their research on students' experiences with flexible learning (including

learning through the VLN), Pratt and Trewern (2011b) found that limited access to computers and fast internet at school was one of the challenges that created frustration in students. A meta-analysis of literature on barriers to successful implementation of ICT in schools shows that lack of access to resources either at school or from home is one of the most common challenges for teachers (Bingimlas, 2009). Teachers in this study talked about the improvement of the available infrastructure from year to year and some of them expressed their concerns regarding the current resources and their access to them that often prevented the seamless blending of online and face-to-face teaching and learning. The school principal acknowledged this limitation and described the school's plans to improve the available infrastructure in the future and move towards encouraging students to bring their own devices to school, in order to make the blend of online and face-to-face teaching more seamless.

In their literature review on common challenges to technology integration in the classroom, Groff and Mouza (2008) explain that new technologies often bring inherent malfunctions and schools have a greater need for technical support in order to address these issues. Similarly, in this study, the school principal explained that the schools' needs for technical support may increase, depending on how easy it will be to seamlessly implement a BYOD initiative at school.

The availability of resources at school depends on other factors, in addition to school leaders' attitudes (e.g. Internet speed, cost of resources, funding), as discussed later (see *Discussion/Professional, bureaucratic, commercial and political organizations*). However, regardless of the other factors, school leaders' attitudes are very important in stimulating change (Zhao & Frank, 2003). The ePrincipal explained that school principals' attitudes towards change vary in schools across the cluster and he further talked about the e-Learning cluster's role in helping school principals to re-shape their perceptions, as discussed later (see *Discussion/Professional, bureaucratic, commercial and political organizations*).

5.5. The parent/community

Fullan and Stiegelbauer (1991) argue that although parents/community are important stakeholders affecting educational reform, their role “has been both sadly neglected and underestimated” (p.246). In this study, the role of the parent in the process of change with blended approaches has been evident, not only in terms of impacting, but also being impacted by change.

The school principal explained that in terms of the uptake of blended approaches, there is often a driver from parents, who know what teachers are doing in one class and the student learning involved, while they often expect their children to use similar approaches in other classes. In a literature review on recurring debates on the role of ICT in education, Wellington (2005) argues that parents in general push the implementation of ICT in education. However, in this study, the ePrincipal, from his

observations in schools across the rural e-Learning cluster, noted that parents often retard change with blended approaches, owing to their different expectations of schooling, based on their own attitudes and the traditional educational approaches they experienced. Teachers 4 and 5 confirmed that some parents' traditional views of teaching and learning prevented them from understanding the reasons teachers were implementing several approaches. This further illustrates the importance of increasing parents' understanding of teachers' practices, by increasing parental involvement and having a shared vision towards student learning, as "when the cultures and learning of the home and school are in alignment, children can benefit from easier transitions between the two contexts and the mutual reinforcement of learning practices and values" (Grant, 2009, p.16).

Parents and other educational stakeholders have an important role to play in supporting teachers to take risks and experiment with new tools and approaches that have the potential to change teaching and learning (Luckin et al., 2009). In this study, parental involvement was also important in ensuring that students had adequate access to computers and internet from home. Most students had access to dial-up internet and, living in a rural area in New Zealand, it may not have been possible for the parents to provide students with high internet speed. This illustrates the further implications for other impacting organizations, as discussed in the following (see Discussion/*Professional, bureaucratic, commercial and political organizations*). In addition, the school's plan to encourage students to bring their own devices to school in the future will have further implications for parents who will need to provide students with reliable and affordable portable devices.

Several schools are using digital technologies to increase parental involvement in student learning, for example by enabling parents' access to class online learning environments (Grant, 2009). Bolstad and Lin (2009), acknowledging the potential of ICT to increase parental engagement in student learning, argue that parents of secondary school students are often less engaged in students' schooling and although investigating parental involvement was not among the scope of their study on students' experiences with learning through the VLN, one of the eTeacher participants in Bolstad and Lin's (2009) research noted that he often contacted his students' parents through video conference or email.

The ePrincipal in this study talked about the potential of blended teaching and learning to strengthen home-school connections and parental involvement, especially with the use of ePortfolios. Although this was not reported by the majority of teachers who were using blended approaches, Teacher 4 explained that her role and practices of giving parents access to the class online environment were determinants in approaching parents appropriately and engaging them in student learning. Teacher 6 also aimed at increasing parental involvement in student learning and encouraged students to share their ePortfolios with their parents. Furthermore, some students in the Year 9 web-enhanced class mentioned that they often taught their parents some of the ICT skills they developed by using ePortfolios.

Therefore, parents' own expectations and teachers' practices of involving parents in student learning are important factors impacting on parents' level of involvement in student learning. In addition, students themselves may impact on parental involvement (Grant, 2009) as discussed previously (see *Discussion/The student*). However, there was not enough evidence in this study to further indicate student impact on parents' involvement and given the importance of strengthening home-school connections, further research on the factors that facilitate parental involvement is recommended.

5.6. Professional, bureaucratic, commercial and political organizations

Moving out of the school context, towards the school district, region, nation and global context, Davis's (2008, in press) arena of change considers the impact of professional organizations in providing support to schools and teachers that, among others, may include networked schools and national associations. The arena also acknowledges the impact of bureaucratic and political organizations, such as the national ministries of education and governments, as well as national and multinational commercial organizations and OER that provide new resources and services.

The school's involvement in national professional organizations, such as the VLN, changed the way students learned by providing them with opportunities to engage in blended distance learning programmes, encouraging at the same time teachers' experimentation with new tools in their face-to-face courses. For example, many teachers from the school engaged in professional development groups regarding the use of Moodle in the classroom, which was developed as a result of the school's involvement in the VLN. Roblyer, Porter, Bielefeldt and Donaldson (2009), researched eTeachers in North America virtual schools, who were also teaching face-to-face courses, and their perceptions on their teaching practice. Most eTeachers reported that their experience teaching in virtual schools improved their teaching practices in their face-to-face classrooms. In the New Zealand context, Barbour (2011), commenting on the growth of e-Learning in New Zealand, argues that new forms of teaching and learning emerge; the growth of the VLN with blended distance courses encourages teachers to experiment with new tools in their face-to-face classes, providing blended web-enhanced learning opportunities to the students. Research in 14 different e-Learning clusters also indicates eTeachers' use of asynchronous online tools in their face-to-face classes, in addition to their VLN classes (Barbour et al., 2011).

Professional organizations in the school's district and wider region, such as the rural e-Learning cluster, the regional ICT PD cluster and the contributing schools' ICT PD cluster, also impacted on the development of blended teaching and learning at the school. The ePrincipal of the school's rural e-Learning cluster talked about the cluster's approach and vision to change school structures with blended teaching and learning and to encourage personalized and networked learning. The cluster has employed several approaches to support this vision and impact on teachers' and school leaders'

attitudes, with the most successful being the development of the regional ICT PD cluster involving more than 30 schools in the region, providing professional development through the BTLPD, including a postgraduate course of study in collaboration with a New Zealand university. The school principal talked about the impact of this project that enables the involved teachers (e.g. Teacher 6 and the ePrincipal) to enrich their knowledge and expertise on blended teaching, sharing their experiences with other colleagues from the school and enabling capacity building among teachers. The school principal also talked about the school's involvement in the contributing schools' cluster, where teachers and school leaders from the involved schools are collaborating and supporting one another in implementing blended teaching and learning, while they also aim to develop a digital citizenship curriculum for the students in primary and secondary schools in the area.

The ICT PD initiative was funded by the New Zealand Ministry of Education, a bureaucratic organization, enabling schools across the country to connect, share and develop teachers' professional learning. The ePrincipal talked about change in school leaders' attitudes with teachers' involvement in the BTLPD led by the regional ICT PD cluster. However, both the ePrincipal and the school principal commented that the year following this study would be the last year of funding from the Ministry of Education for the ICT PD clusters. The ePrincipal expressed his concerns regarding the continuation of providing effective professional development that encourages sustainable implementation of blended teaching and learning, after the end of the funding period. This illustrates the implications that are involved for bureaucratic organizations such as the Ministry of Education, which can support schools/teachers in their effort to change teaching and learning with blended approaches. The Ministry of Education funds other projects as well that have a direct impact on the uptake of blended approaches at the school, such as the Teacher Laptop (TELA) scheme, that increased teachers' ICT confidence and use in the classroom (Cowie et al., 2008), as well as the National VLN.

The impact of commercial organizations and OER was evident in this study, as the availability of tools impacted on participants' attitudes and practices. The school principal explained that as more and more tools became available, teachers were experimenting with these in their classes while developing their skills and confidence. Teacher participants had the opportunity to select from a range of tools, depending on the needs and confidence of the class.

Some of these tools encouraged the use of student-centred approaches in the class, with a direct impact on teachers' pedagogy, while others encouraged the strengthening of home-school relationships (e.g. VLN portfolio developed by Mahara – open source ePortfolios), improvement of students' quality of work (e.g. various Web 2.0 tools, such as Voicethread, Animoto) as well as connectedness and collaboration between schools (e.g. regional cluster's Moodle, VLN portfolio by Mahara). The ePrincipal further discussed the implications that emerge when schools use different systems, as this does not enable them to create networks and collaborate with each other.

Participants talked about the importance of increasing the ease of use and compatibility of online tools, indicating further implications for commercial organizations and OER in improving these aspects. Although in general new online tools are perceived by some to be relatively easy to use by anyone (Richardson, 2006) in the embedded case study in particular, several challenges that both the teacher and the students experienced throughout the implementation of ePortfolios were indicated, despite the fact that the teacher was a confident user of ICT and one of the early adopters of digital technologies in the classroom.

The impact of commercial organizations and OER is also evident considering the costs involved for schools in order to provide adequate access to resources. Although most online tools that were used at the school were open source (e.g. Moodle, VLN portfolio, Wikispaces and other Web 2.0 tools), the cost of updating and sustaining the infrastructure was mentioned by the school principal as a factor impacting on change. He contended that as portable devices become more affordable, it will be easier for the school to encourage students to bring their own digital devices to class. He added that another aspect that will determine the more seamless implementation of blended approaches is the schools' internet access.

Limited access to the internet was a challenge that most adult participants talked about, either at school or from home, being in a rural area in New Zealand. According to the World Internet Project in New Zealand (Smith, Gibson, Crothers, Billot, & Bell 2011), broadband internet access has always been lowest in rural areas in New Zealand, while since 2007 it has increased from 47% to 84% of internet users. Participants in this study expected that the UFB initiative of the New Zealand government will address this issue, equipping almost 97% of schools and 75% of homes with high speed internet access by 2016. This confirms the important role of political organizations in the process of change, as suggested in Davis's (2008, in press) arena of change.

Chapter 6: Conclusions and recommendations

6.1. Conclusions

This thesis presents a case study of blended teaching and learning in a New Zealand school using an ecological framework. Davis's (2008, in press) arena of change (see *Figure 1*) was used for the first time to frame a description of how blended teaching and learning was implemented in a secondary school (see *Figure 15*).

The use of blended approaches in one rural secondary school in New Zealand (main case) was researched, through interviews with the school principal and six teachers from the school using blended approaches, as well as a review of relevant documents/web resources. Two of these teachers were teaching blended distance courses through the VLN, one of whom was the school's eDean. Five teacher participants were teaching blended web-enhanced courses, using a variety of online tools (e.g. Moodle, VLN portfolio). The school principal's openness in enabling teacher choice regarding their practices in their classes and professional development, teachers' attitudes, pedagogy and level of involvement in professional development impacted favourably on the development of blended teaching and learning at the school. Parental support to students and teachers was also important to enable effective implementation of blended approaches.

The practices of one teacher (Teacher 6) in his Year 9 blended web-enhanced class (see *Figure 15*) were further researched as an embedded case study to provide more detail, through observations in the class, group interviews with six students and a review of relevant documents/web resources, in addition to an interview with the class teacher. Blended teaching and learning impacted on the teacher's and students' roles and several advantages and challenges for both the teacher and the students were identified. Teacher 6 had a significant impact not only on the effective implementation of blended web-enhanced teaching and learning in the class, but also across the school: through his involvement in the BTLPD, offered by the regional ICT PD cluster in collaboration with a New Zealand university, Teacher 6 developed his blended teaching knowledge and skills, which he applied in his class and also shared with other colleagues within and across the school. Student readiness to learn in a blended environment as well as their positive attitudes towards blended learning supported the effective implementation of blended approaches in their class.

The impact of blended learning on the wider ecosystem in which the school was embedded (see *Figure 15*) was researched, through an interview with the ePrincipal of the school's e-Learning cluster (who was also a teacher at this school), a review of relevant documents/web resources, in addition to data from the interviews with the teachers and the school principal. Professional organizations also had an impact on the development of blended approaches at the school. The e-Learning cluster

enabled the development of blended distance teaching and learning, as well as the sharing of a vision towards personalized and connected learning. The regional ICT PD cluster in collaboration with a New Zealand university facilitated the development of blended teaching and learning at the school, through Teacher 6's and the ePrincipal's involvement in the BTLPD. The school's involvement in the VLN also contributed to teachers' capacity building and use of blended web-enhanced approaches in face-to-face classes. Bureaucratic organizations (e.g. the Ministry of Education) provided the resources to enable professional organizations to offer adequate support to schools (e.g. funding for ICT PD clusters). National and multinational commercial organizations/OER, such as Moodle and Mahara, provided the software and related support to the school and the e-Learning cluster in general to implement blended teaching and learning, by offering tools which incorporated several affordances (e.g. enabling independent and personalized learning), while also involving several constraints (e.g. usability issues). The impact of political organizations was also evident, in particular through the expectation that the New Zealand government's UFBiS initiative would encourage the development of blended teaching and learning in this and in other schools across the e-Learning cluster.

Overall, this case study illustrates the complexity of educational change with blended teaching and learning that involves many factors, within and beyond the school. This study acknowledges the teacher as the keystone species in the educational ecosystem (Zhao & Frank, 2003; Davis, 2008) and it also identifies the important role of other stakeholders in educational change, such as school leaders, students, parents and individuals involved in professional, bureaucratic, commercial/OER and political organizations. The use of an ecological framework provided an effective way to describe the complex process of change with blended teaching and learning in a school.

6.2. Recommendations

Findings from the ecological framework illustrating the use of blended teaching and learning in a school correspond with existing research literature, as discussed in the previous chapter. They give rise to several recommendations. However, the methodological limitations of this case study, researching only one school and individuals from within the specific context, indicate the need to take the following recommendations cautiously. Key literature is provided to support these cautious generalizations.

Given the impact of multiple individuals on the effective development of blended teaching and learning at the school, a shared vision is necessary not only among individuals within the school, but among educational stakeholders across the school's multi-level and embedded ecologies. Moreover, according to Davis (in press) the closer an organization or stakeholder is to the teacher, the more they are likely to impact on the development of blended teaching and learning in the class. Therefore, general recommendations in this study suggest the development and maintenance of open

communication channels, direct collaboration and targeted support from individuals and organizations near the class/school context. At the same time, the provision of ongoing support from the wider ecosystem in which the school is embedded is necessary, encouraging the sharing of an inspiring vision for the wider educational context and providing the conditions that can facilitate change.

More specifically, these recommendations can be grouped into three main categories that are based on the Davis's (2008, in press) framework, addressing to individuals in the class ecosystem, the school ecosystem, and the wider ecosystem in which schools are embedded.

6.2.1. The class ecosystem

Within the class, three important stakeholders are identified who can directly support one another and impact on the effective implementation of blended teaching and learning: the student, the teacher and the parent/community. Acknowledging the role of the teacher as the keystone species in the class ecosystem, the following recommendations are suggested for teachers, in order to effectively use blended teaching and learning within the class and to develop effective partnerships with students and parents/community.

- Gradual student transition from traditional to independent learning

In this study although blended learning encouraged students to develop independent learning skills, student low readiness to learn in a blended environment, mainly because of difficulties in self-directing their learning, was an important challenge. Other studies also indicate that learning independently is both an advantage and challenge for school students (e.g. Bolstad & Lin, 2009). The teacher's role in effectively supporting the students to develop independent learning skills is very important (Parkes et al., 2011). In blended distance courses, where students are not at the same school as their eTeacher, the role of an onsite supervisor (eDean) is important in providing students with adequate support (Davis & Niederhauser, 2007; Stevens, 2011).

Enabling students to gradually familiarize themselves with independent learning is recommended, by providing them progressively with more opportunities to self-direct their learning. Direct support and guidance from the teacher are necessary particularly at the beginning, depending on students' skills and confidence to learn independently. The teacher may then increase gradually learner control, acting more as a facilitator, rather than director of student learning. Supplementing the eTeacher, the support provided by the eDean or onsite supervisor is recommended to start with more direction and guidance at the beginning and increase gradually learner control, depending on students' needs and confidence.

- Clear explanation of goals with opportunities for student input

Student participants in this study talked about their increased need for more guidance and the challenges they faced in learning independently at school and from home. They also talked about

aspects of blended learning they enjoyed more (e.g. use of multimedia, opportunity to personalize their ePortfolio pages) and less (e.g. reflecting online). Findings also indicated that students found difficulties in understanding the usefulness of some practices, which impacted on their engagement with several activities (e.g. online reflection). Other studies (e.g. Parkes et al., 2011) discuss students' level of maturity, which can prevent them from understanding teaching goals and objectives, as well as student difficulty in using ICT in educationally focused ways, despite their familiarity with new technologies (e.g. Wright, 2010). Jonassen (2003), describing the characteristics of meaningful learning argues that when students are able to "articulate what they have learned and reflect on the processes and decisions that were entailed by the process, they understand more and are better able to use the knowledge that they have constructed in new situations" (p.8). In addition, Spires et al. (2008), referring to the educational use of ICT in general, argue that "if we make student perspectives a regular part of the educational dialogue and action agenda, we may create a proactive stance to student academic engagement and achievement needs and subsequently contribute to a more responsive and innovative schooling progress" (p.513).

The study suggests explaining clearly to students the teaching goals and objectives, not only in terms of what they are expected to do, but also in terms of why and how the implemented practices will improve their learning. Considering student input in the process of goal setting is also important to increase the relevance and meaningfulness of the implemented practices for the students. Therefore, providing ongoing opportunities for student feedback (online and face-to-face) is also recommended to help teachers understand and address students' diverse needs, inform their practices and pedagogy and provide students with meaningful learning experiences. This can also increase teachers' awareness of the implications that blended learning involves for students (e.g. increased time demands and challenges with access at home), in order to plan accordingly the requirements for student blended learning beyond class time and school hours.

- Interactive teacher-parent communication

Strong parent-teacher partnerships are important, given the implications that blended approaches involve for parents (e.g. provision of adequate access and support to students from home), as well as the impact of parental attitudes on teachers' decisions towards the use blended approaches, as found in this research and also confirmed by other studies (e.g. Wellington, 2005; Luckin et al., 2009). Some teachers in this study indicated that some parents' involvement in student learning was increased, as parents were able to access student learning online. However, this was not reported for the majority of parents, indicating further factors that may impact on their involvement in student learning. For example, some students reported that they often 'taught' their parents some of the ICT skills they were developing in their blended web-enhanced class. Enabling parents' access to the online environments used in class is one of the practices schools are recommended to provide to increase

parental involvement and support (Grant, 2009). Grant (2009) also discusses the role of students in encouraging parental involvement, as well as the importance of providing parents with opportunities for input in these online environments, in order to increase their involvement in student learning.

This study suggests the use of online tools by teachers not only as a means to increase parents' access to student learning, but also as a way to strengthen teacher-parent relationships, by enabling bidirectional parent-teacher communication. Therefore, parental involvement with the use of online tools may involve two levels; at the first level, sharing examples of student learning online with parents may increase parents' understanding of teachers' practices and vision and enable them to provide students with better support from home, while also increasing relevant ICT and facilitation skills. At the second level, teachers may consider using online tools that provide parents with opportunities to contribute their feedback, to increase teachers' understanding of the implications that blended approaches involve for parents and to accordingly inform their blended teaching planning.

6.2.2. The school ecosystem

The study identifies the importance of teachers and school leaders as stakeholders who can directly support one another, through teacher-teacher and teacher-school leader partnerships.

Recommendations in this section are suggested for both teachers and school leaders, who can play an important role in strengthening the aforementioned partnerships and contribute to the development of blended teaching and learning at the school.

- In-school professional development

In this study teachers' capacity building challenges were evident, owing to teachers' increased time demands, their attitudes towards blended teaching and learning, as well as their pedagogical approaches when teaching in a blended environment. Such challenges are also confirmed by the literature (e.g. Parkes et al., 2011; Ward, 2008). Teachers' willingness to share their educational experiences regarding blended teaching did not always engage other teachers in the school. However for the teachers who were already using or interested in implementing blended approaches, engaging in professional development at the school, in which teachers worked towards similar goals and shared their implemented practices (e.g. teachers' involvement in the Moodle groups) was important to support one another. Teacher 6 was one of the teachers who had the opportunity and time release to share with other teachers from the school his knowledge and skills that he developed through the BTLPD. Lai et al. (2006) discuss the advantages of collaborating in communities of practice, which include individual and collective professional growth.

Recommendations in this study encourage teachers to share/keep sharing their blended teaching knowledge and practices with other staff members, collaborating in communities of practice through in-school professional development, with the aim of increasing capacity building in schools. This

way, teachers, who act as agents of change by sharing their practices and knowledge, may contribute to the development of a shared vision in their school culture. By involving other teachers and school leaders in these communities, both teachers' and school leaders' professional growth can be enabled. At the same time, this also has the potential to increase school leaders' understanding of the implications of blended approaches for teachers' role, including increased time demands, professional development needs and access issues.

- Enabling teacher choice, balanced with adequate guidance

Teachers' opportunity to experiment with new tools and engage in professional development depending on their own needs and confidence was important for their capacity building, as described in this study. The role of the school principal was pivotal in encouraging this culture, which is also confirmed by relevant literature (e.g. Zhao & Frank, 2003; Davis, in press). Findings in this research and other studies also indicate that teachers often need additional support at the initial stages of their experimentation with new tools (Frailich et al., 2007; Lee, 2006).

Therefore, the provision of a variety of professional development opportunities, including opportunities within the school, depending on teachers' needs and confidence is recommended, in addition to school leadership openness in enabling teacher choice regarding the blended approach and tools they will use, as well as the types of professional development they will engage in. This study also suggests that in addition to encouraging teacher choice, it is important to also offer adequate guidance and support, especially at the initial stages of teachers' experimentation with blended teaching, providing more or less direction, depending on teachers' needs and confidence.

- Provision of adequate infrastructure at the school

Teacher participants in this study talked about challenges with access to adequate infrastructure at the school, owing to increased resource demands from other teachers, which is a common challenge also reported by other studies (e.g. Bingimlas, 2009). For some students in this study, using the available resources at the school was their only option when engaging in blended learning, because of limited access to resources at their home. The school was already responsive to increased resource demands over the last years and planned to further improve the available infrastructure in the future to address increasing resource demands. The school principal also discussed the potential need for additional technical staff in the future. As Lee (2006) argues, adequate access to hardware and software is essential for the effective implementation of blended teaching and learning in schools.

Recommendations in this study suggest the provision of adequate access to resources at schools for both teachers and students, to enable more seamless implementation of blended teaching and learning. In addition, readily accessible resources at schools are important for students with limited access to

resources from home and can also encourage the adoption of blended approaches amongst teachers who experiment with online tools in their classes before adopting blended teaching.

6.2.3. The wider ecosystem in which schools are embedded

In this context, two levels of support are identified that can contribute to the development of blended teaching and learning in schools: Direct support from ecosystems near the school and ongoing support from other ecosystems that interact with the school from outside.

Schools can benefit from direct support from organizations or individuals near their ecosystem, through effective partnerships with other schools and professional organizations. Recommendations in this section refer to school leaders and other stakeholders in leading positions, such as ePrincipals, who play an important role in these partnerships.

- Out of school professional development and support

Although most schools encourage in-school professional development, few take the next step and support teacher engagement in networks outside the school walls (Riel, 2009). In this study, opportunities for professional development beyond the school, through the school's involvement in the regional ICT PD cluster that offered personalized professional development (BTLPD) to one of the teachers (Teacher 6) and the ePrincipal, in collaboration with a New Zealand university, contributed to teachers' capacity building and the growth of blended learning at the school and enhanced the school's collaboration with other schools. The ePrincipal, commenting on the impact of the BTLPD on schools across the cluster, also talked about positive changes on teachers' and on school leaders' attitudes and vision. Adequate professional development for onsite facilitators (eDeans) is also important for the effective implementation of blended distance courses (Irvin et al., 2008).

Encouraging teachers' and school leaders' engagement in professional networks, with provision of professional development out of their own schools is recommended, in addition to in-school professional development, to further increase schools' capacity building and collaboration with other schools. Professional organizations, such as universities and e-Learning clusters are recommended to provide/continue providing professional development and support that are customized to differing school needs, while encouraging, at the same time, teachers, eDeans and school leaders from different schools to work together through online communities of practice. During the planning for the development of these communities, it is also important to consider the variety of characteristics of online and co-located communities of practice (see also Lai et al., 2006).

In addition to direct support from individuals within the school, as well as professional organizations, recommendations for individuals in political, bureaucratic and commercial (also including OER) organizations (e.g. policy makers, regional staff, developers) include the provision of ongoing support for the wider educational context, encouraging the sharing of an inspiring vision and providing the conditions that can facilitate change.

- Financial support and visionary policies

Funding from the Ministry of Education enabled the development of the regional ICT PD cluster to provide professional development through the BTLPD to schools, including the school in this study. The school principal also talked about the impact of other initiatives funded by the Ministry of Education (e.g. TELA programme, VLN) on teachers' capacity building and on the growth of blended teaching and learning at the school. Participants in this study also expected that blended teaching and learning will further develop with the rollout of UFBiS to 97% of schools by 2016, funded by the New Zealand government. Powell and Barbour (2011) acknowledge that visionary policies by the New Zealand Ministry of Education have contributed to the growth of e-Learning in primary and secondary schools across the country.

Therefore, bureaucratic and political organizations are recommended to provide/continue providing financial support and implementing visionary policies regarding e-Learning, targeting professional organizations and the wider educational context and considering the needs of schools. This way, capacity building among schools and the development of a common vision towards teaching and learning in the 21st century can be enhanced.

- Development of affordable and reliable tools that support 21st century learning goals

In this study, the school principal explained that as the availability of tools increases, teachers are experimenting more with blended approaches. As the cost of digital devices is reduced the school will also consider implementing an official BYOD policy to improve access. The online tools that teachers and students used incorporated several affordances and constraints which facilitated or prevented teachers from effectively implementing blended teaching and learning (e.g. at anytime and from anywhere access and independent student learning, usability issues). Gilbert (2007) acknowledges the potential of ICT to change teaching and learning by enabling collaboration, multi-media literacy, active knowledge building.

Therefore, it is important for commercial organizations/OER to continue developing affordable, reliable and easy to use tools that are compatible within and across schools in New Zealand and to consider the needs of today's schools and teachers' level of confidence. They are also recommended

to carefully incorporate affordances that facilitate student-centred learning and have the potential to address 21st century teaching and learning goals.

6.3. Implications for research

In the literature review chapter, the need for further research on blended school education was acknowledged, given the growth of blended teaching and learning for educational providers globally (Horn & Staker, 2011) and the limited research focusing on blended education for school contexts (Means et al., 2009). The importance of research on blended school education in the New Zealand context was also discussed, given the existing and expected growth of the use of blended approaches in schools across the country, owing to reasons such as the UFBiS initiative and schools' increased need for flexibility.

Through this study, a deep understanding of how blended teaching and learning was implemented in one New Zealand secondary school was provided, using an ecological framework to indicate the complexity of educational change and the impact of multiple stakeholders or organizations on the effective implementation of blended approaches in schools, as well as the implications that are involved for them. Alongside relevant literature, findings in this study provided the basis for the suggestion of several recommendations. Several questions were raised through this study that indicate diverse areas for future research.

Firstly, given the important role of the parent in blended learning, it will be valuable to ask questions such as: What are parents' perspectives on blended teaching and learning? What is the impact of their expectations on teachers' practices with blended approaches? To what extent are parents willing to support students with blended learning at home? How can students increase parental involvement in their blended learning? What other factors can enhance parental involvement in students' blended learning?

Given the impact of the growth of blended distance teaching and learning on the uptake of blended web-enhanced teaching and learning in this school, also confirmed by other studies (e.g. Barbour et al., 2011; Roblyer et al., 2009), further and more detailed research is recommended on the ways in which eDeans', ePrincipals' and eTeachers' capacity building regarding the use of blended web-enhanced teaching is or can be enhanced with their involvement in blended distance teaching.

Finally, using an ecological framework to research the use of blended teaching and learning in schools is recommended, in an attempt to clarify the complexity of change and identify dependencies on multiple stakeholders in addition to the teacher, who is "the keystone species in the educational ecologies of the twenty-first century world" (Davis, 2008, p. 517). In addition, as the teacher's role

spreads with more blending (Davis, in press), there will be an increasing variety of ecosystems and roles to research.

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Appendices

Appendix 1: Key literature informing the literature review

Author(s) and year	Type	Context/sector/ subject (if applicable)	Central focus			Data collection method(s)
			Using authors' terms	Using this thesis' terms		
				Blended distance teaching and learning	Blended web-enhanced teaching and learning	
Barbour & Reeves (2009)	Literature review	North America Primary/ secondary	Overview of virtual schooling, benefits, challenges, directions for future research	✓		Review of the literature on virtual schooling research
Bolstad & Lin (2009)	Empirical study	New Zealand Secondary	Students' experiences learning in virtual classrooms	✓		Student surveys Student focus group interviews

						Teacher workshops
Cavanaugh, Barbour & Clark (2009)	Literature review	North America Primary/ secondary	Review of open access literature on online school education to identify current research themes	✓		Review of open access literature on K-12 online learning
Chandra & Fisher (2009)	Empirical study	Australia Secondary Science	Student perceptions on learning in a blended web-based environment		✓	Student survey Student emails
Dewstow & Wright (2005)	Empirical study	New Zealand Secondary ICT	Student-teacher-external expert collaboration to develop an online learning environment, supported by an online forum		✓	Interviews with the students, the teacher and the external expert
Doering & Veletsianos (2008)	Empirical study	North America Primary	Teachers' integration models of hybrid online education, student perceptions according to integration model using adventure learning		✓	Observations Student focus group interviews Teacher interviews

Frailich, Kesner & Hofstein (2007)	Empirical study	Israel Secondary Chemistry	Influence of web-based chemistry learning on student perceptions, attitudes and achievements		✓	Student surveys Achievement pre test and post test
Irvin, Hannum, Lei & Farmer (2008)	Empirical study	USA Secondary Advanced placement English Literature and Composition	The role of an adult facilitator in supporting online distance education students	✓		Student survey Facilitator survey Student achievement pre test Observations Course completion records
Hughes, McLeod, Brown, Maeda, Choi (2007)	Empirical study	USA Secondary Algebra	Comparison of student achievement and perceptions in virtual and traditional Algebra classes	✓		Demographic student survey Assessment on Algebraic understanding Assessment on classroom perceptions
Lee (2006)	Empirical study	Hong Kong	Cultural change in schools with online learning		✓	Teachers' survey

		Primary				<p>School principals' survey</p> <p>Semi structured interviews with teachers, students, principals</p> <p>Online learning environment student records</p> <p>Teachers' reflective journals</p>
Mupinga (2005)	Position paper	USA Secondary	Benefits - challenges of distance education, suggestions for schools	✓		Drawing on the literature on distance education
Ng (2008)	Empirical study	Australia Primary Science	Student self-directed learning and perceptions on learning through web-based Science learning sites		✓	<p>Pre test on student attitudes and prior knowledge</p> <p>Observations</p> <p>Student interviews</p> <p>Teacher interview</p>
Nicholas & Ng	Empirical	Australia	Student motivation, collaboration and engagement in open learning	✓		Student records from the

(2009)	study	Secondary Science	supported by online technologies, as part of a Science camp			online learning environment Student focus group interviews Teacher interview
Oblender (2002)	Position paper	USA Primary/secondary	Hybrid teaching and learning as a solution to high dropout rates in online courses	✓	✓	Student survey
O'Dwyer, Carey & Kleinman (2007)	Empirical study	USA Secondary Algebra	Comparing student achievement and outcomes in a face-to-face and online Algebra course	✓		Pre test and post test on student achievement Survey on student experiences
Parkes, Zaka & Davis (2011)	Empirical study	New Zealand Secondary Home Economics	Pilot study on a teacher's practices implementing the first blended course in high school, the teacher's and students' blended teaching and learning experiences		✓	Observations Student focus group interviews Teacher interviews

Pratt & Trewern (2011a, 2011b)	Empirical studies	New Zealand Secondary	Students' experiences with blended learning - being enrolled in both face-to-face courses and courses in other formats (e.g. video conference, correspondence)	✓		Student surveys Student interviews
Pullar & Brennan (2008)	Empirical study	New Zealand Secondary	Students' experiences with blended (distance/face to face/vocational) learning	✓		Student interviews
Stevens (2011)	Empirical study	New Zealand Secondary	E-learning and educational leadership practices within and across New Zealand e-learning clusters	✓		Interviews with ePrincipals, eTeachers, site supervisors, school principals and National Officials Document analysis
Tunison & Noonan (2001)	Empirical study	Canada Secondary	Secondary students' first experience with online learning - demographics, perceived benefits and challenges	✓		Student survey

Wang & Reeves (2006)	Empirical study	USA Secondary Science	Student motivation learning within a face-to-face class where a web-based learning environment was implemented		✓	Student surveys Observations Student interviews Teacher interviews
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Appendix 2: Participant interview questions

ePrincipal

1. Tell me about how you first came to become the e-principal of the school's e-learning cluster.
2. What is your vision as an ePrincipal of the e-Learning cluster? What practices has the e-Learning cluster undertaken to support this vision?
3. In what ways have you seen blended approaches supporting/not supporting your vision for <....>?
4. What is the current state of the use of blended teaching and learning at schools across the cluster?
5. What advantages do you expect with the implementation of blended teaching and learning? What are the advantages that you expected at the beginning?
6. What challenges do you observe or experience? What are the challenges that you expected at the beginning?
7. What other factors have you seen impacting (positively or negatively) on the uptake of blended teaching and learning approaches?
8. To what extent have you found schools across the cluster ready for blended teaching and learning?
9. What do you think can further encourage the effective implementation of blended approaches in schools across the cluster?
10. Is there anything else you would like to add?

School principal

1st interview

1. When was blended learning introduced at your school and what tools are being used?
2. The following question focuses on the perceived relative advantage of using blended approaches, which refers to the benefits that people identify in adopting an innovation. Before the implementation, what relative advantage of using blended approaches did you, as the school principal and other staff members perceive over current practice?
3. The next theme focuses on the perceived compatibility of blended approaches, which is the degree to which an innovation is perceived as consistent with the existing practices, values or tools. How similar have you found the use blended approaches to existing teaching methods or technology at your school?
4. The next question focuses on the perceived complexity of using blended approaches, referring to the degree to which an innovation is perceived as relatively difficult to understand and use.

What concerns did you or other staff members have regarding the challenges of introducing this innovation at your school?

5. The following question focuses on the trialability of blended approaches, referring to to the extent that an innovation can be trialed, experimented with on a limited basis before its adoption. What opportunities (if any) were there for you or the teachers to trial blended learning, before adopting this approach?
6. Finally, with regard to observability, referring to the degree to which the results of an innovation are visible to others, what results did you observe with the use of blended approaches at the school?
7. How has this impacted on the use of blended approaches at the school now? Is the innovation sustained because of.../Not sustained because of...
8. What do you expect in the future regarding blended learning at your school?

2nd interview

1. Some of the teachers talked to me about the Moodle PD sessions at the school which they found really useful. Could you talk to me a little bit more about the PD provided by the school and your plans for next year in terms of PD?
2. What about the PD provided from the ICT PD cluster? Has the BTLPD had any impact on e-Learning at the school? What can the cluster do to further support the school in terms of e-Learning?
3. One of the themes based on the interviews with most teachers is the use of ePortfolios and the benefits they can have for student learning and also for strengthening home-school connections. What is your perception of that? What do you see for the future in terms of ePortfolio use at the school?
4. We were discussing in our previous interview about barriers that appear because of some teachers' resistance to change. Some of the teachers also talked about their concerns with regard to this issue and the challenges it involves in building capacity. What do you think in general about staff readiness to change? What do you think can encourage them? Do you expect these attitudes to change?
5. Another theme is that most teacher participants expect that increased access to resources will enable more seamless blend of online approaches with face-to-face teaching and learning. What are the school's plans in terms of upgrading or not the existing infrastructure for next year?
6. As part of improving access to resources, do you see the school connecting and working together with other schools in the future?

7. Is there anything else you would like to add?

Teachers

1. Could you tell me about the subjects that you are teaching?
2. What is your vision for effective student learning? What practices have you been undertaking to realize this vision?
3. What is your perception of the potential of blended teaching to address your vision and goals as a teacher?
4. Could you tell me a few things about your use of blended teaching with your students?
5. Why did you decide to use blended teaching with your students? What other factors encouraged you?
6. What advantages do you observe as a teacher in using blended approaches? What about your students?
7. What challenges are you experiencing with blended teaching? What about your students? Are these the challenges you expected at the beginning?
8. Has the use of blended teaching changed the way you teach, in terms of pedagogy?
9. What do you think would be necessary to help you better implement blended teaching with your students?
10. Would you consider using blended teaching with your students next year? Why yes/not? What other tools do you consider using?
11. Is there anything else you would like to add?

Students

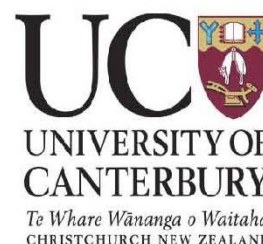
1. What is your favourite subject and why?
2. How often do you use ICT on your everyday life (computer, video games, cell phone, mobile devices...)? Do you own any digital devices?
3. In addition to your Year 9 form and Science class, are there any other subjects where you use computers and online tools? Can you give me an example?
4. What are you normally doing with online tools? What are you usually expected to do after the teaching period with these tools?
5. How do you think this helps your learning? What about the ePortfolios in your Year 9 class – how do they help?
6. What do you think makes using online tools for your learning difficult? Did you expect the same challenges from the beginning?
7. What kind of help do you usually need when you learn with ePortfolios? Where do you usually go if you need help? Why?
8. What do you enjoy more when using online tools?

9. What do you enjoy less?
10. What would you suggest, to make learning with these online tools more interesting to you?
11. Has the use of online tools changed the way you feel for those subjects? If yes, in what ways?
12. What do you think is necessary to succeed in these courses, where you learn online and face-to-face?
13. Would you like to use some of these tools in more subjects? Which ones and why?
14. Would you like to add anything else?

Appendix 3: Information letters and consent forms

College of Education

School of Literacies and Arts in Education
Tel: +64 3 343 9606, Fax: + 64 343 7790



Information Sheet for the participants (e-principal)

Project title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

My name is Pinelopi Zaka and I am a Masters student at the College of Education, University of Canterbury. My research activity will investigate the implementation of blended teaching and learning approaches (a combination of online and face-to-face learning activities) in New Zealand schools, in order to inform professional and organizational development. Your experience and particular viewpoints will make an important contribution to this research.

As part of the study, I would like to examine your perspectives, as an e-principal of an e-learning cluster, on blended teaching and learning. Data will be gathered, with your informed consent, interviewing you on your experiences regarding the implementation of blended teaching and learning at your school and across the e-learning cluster.

Your involvement in this project will include an interview on your experience regarding the implementation of blended teaching and learning at your school and its cluster. The interview will take about 20 minutes and will be audio recorded. You may request the recording to be stopped temporarily or permanently if at any time you feel uncomfortable. As the principal researcher, I will conduct and transcribe the interview, that will be carried out on a place and time that best suits you. You may be provided if you wish with a copy of the interview transcript for review and approval and a summary of the results. Your participation is voluntary and you have the right to withdraw from the project at any time. If you choose to withdraw, I will use my best endeavours to remove any of the information relating to you from the project, including any final publication, provided that this remains practically achievable. The research will not interfere with the normal course schedule.

All information will be treated in strictest confidence, all participants will remain anonymous. There is a small risk to complete anonymity due to your high profile position as the e-principal of the school's e-learning cluster. However, you will be provided with a copy of your interview transcript for review and approval, while any information derived from the data that might expose or harm you will not be included in the findings. If this information is important to the findings, you will be informed about this issue and only after your permission the information will be included, keeping you anonymous.

All data will be kept by me as the researcher and any data that can identify the participants will not be given to any other researcher or agency. As required by the University's research policy, at the completion of the project all information collected will be retained in secure storage for five years, after which it will be destroyed. The findings of the study, where all participants will remain anonymous, will be shared the school. The results of the study may be submitted for publication to national or international journals or presented at educational conferences. You may at any time ask for additional information or results from the study. Reasonable precautions will be taken to protect privacy of data transmitted through the Internet.

If you would like more information or have any questions about the research, you can contact me or my supervisor Professor Niki Davis (niki.davis@canterbury.ac.nz). If you have any concerns or complaints about this research, please contact the Chair, Educational Research Human Ethics Committee (use the contact details below). If you are happy to take part you will need to sign the consent form and return it to me by _____. Please retain this information sheet. Thank you for your consideration of this research project.

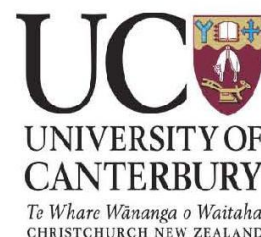
Pinelopi Zaka, (pinelopi.zaka@pg.canterbury.ac.nz)
Phone: -----

This project has received ethical approval from the University of Canterbury, Educational Research Human Ethics Committee.

Complaints may be addressed to:

The Chair,
Educational Research Human Ethics Committee
University of Canterbury, Private Bag 4800, Christchurch
Email: human-ethics@canterbury.ac.nz

College of Education
School of Literacies and Arts in Education
Tel: +64 3 343 9606, Fax: + 64 343 7790



Project Title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

E-principal Consent Form

I understand the aims and purposes of the research study undertaken by **Pinelopi Zaka**

- The study has been explained to me and I understand the information that was given to me on the information sheet.
- I am aware that my participation in this project is voluntary. I have had all questions answered to my satisfaction.
- I understand that my involvement will include an audio recorded interview with the researcher on my experience, as an e-principal, regarding the implementation of blended teaching and learning at my school and across the e-learning cluster.
- I understand that I can withdraw from the study at any time, without giving any reason for withdrawing.
- I understand that all information will be treated in strictest confidence, that participants will remain anonymous and that no information that could identify me will be given to other researchers or agencies. I understand that reasonable precautions have been taken to protect privacy of data transmitted through the internet.
- Any anonymity risks have been explained to me and I understand the precautions that will be taken to minimize potential harm.
- I understand that within these restrictions, the findings will be shared the school; the findings may be submitted for publication to national or international journals or presented at educational conferences; that the results of the study can be made available to me at my request and that I can request additional information at any time.
- I understand that interviews will be recorded and I can ask the recording to be stopped any time temporarily or permanently. I may be provided if I wish with a copy of interview transcript to check for accuracy and a summary of the results.
- I have read the information sheet and consent form. I agree to participate in the study.

Name _____

Signature _____ Date _____

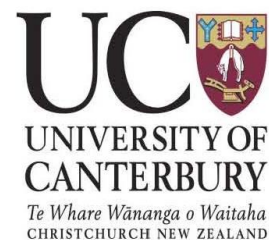
Please return this form in person or through e-mail to Pinelopi Zaka by _____
(pinelopi.zaka@pg.canterbury.ac.nz)

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College of Education

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Information Sheet for the school principal

Project title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

My name is Pinelopi Zaka and I am a Masters student at the College of Education, University of Canterbury. My research activity will investigate the implementation of blended teaching and learning approaches (a combination of online and face-to-face learning activities) in New Zealand schools, in order to inform professional and organizational development. Your school's participation in this project will make an important contribution to this research.

As part of the study, I will examine school leaders', teachers' and students' experiences regarding the implementation of blended teaching and learning at your school. Data will be gathered, with school leaders', teachers' and students' informed consent, interviewing them on their experiences throughout the implementation of blended teaching and learning. More data will be gathered on the use of blended teaching and learning in one classroom, as well as observations of the course's online and face-to-face learning environment.

Your school's involvement in this project will include individual interviews with you, as the school principal and 3-5 teachers from your school. I will also carry out observations in one classroom (Year 9 Science) where blended teaching and learning is used, an interview with the class teacher and focus group interviews with 6-8 students of the same classroom. Each interview will take about 20 minutes and will be audio recorded. Participants may request the recording to be stopped temporarily or permanently if at any time they feel uncomfortable. As the principal researcher, I will conduct and transcribe all the interviews that will be carried out on a place and time that best suits the participants (except for the students who will be interviewed at school, therefore selecting only the time of the interview). With regard to the interview with you, as the school principal, you may be provided if you wish with a copy of the interview transcript for review and approval and a summary of the results. My observations will include visiting your school's Year 9 Science face-to-face class approximately once a week during term 3, as well as observe the course's online learning environment through remote access, in order to collect data on student participation and interactions with their teacher, classmates and course content, as well as on the teachers' blended teaching practices. Participation is voluntary and all participants have the right to withdraw from the project at any time. If you or another participant chooses to withdraw, I will use my best endeavours to remove any of the information relating to him/her from the project, including any final publication, provided that this remains practically achievable. The research will not interfere with the normal school schedule.

All information will be treated in strictest confidence, all participants will remain anonymous. There is a small risk to complete anonymity due to your high profile position as the school principal. However, you will be provided with a copy of your interview transcript for review and approval, while any information derived from the data that might expose or harm you will not be included in the findings. If this information is important to the findings, you will be informed about this issue and only after your permission the information will be included, keeping you anonymous. There is also a small risk to students' complete anonymity, as they will not remain anonymous to each other during the group interviews. To minimize any risk due to this issue, at the beginning of the interview the students will be reminded of the importance of retaining anonymity and confidentiality of students' responses, while student maturity, combined with the nature of the questions that will avoid discussion on private or sensitive issues will minimize the potential harm.

All data will be kept by me as the researcher and any data that can identify the participants will not be given to any other researcher or agency. As required by the University's research policy, at the completion of the project all information collected will be retained in secure storage for five years, after which it will be destroyed. The findings of the study, where all participants will remain anonymous, will be shared with the school. The results of the study may be

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submitted for publication to national or international journals or presented at educational conferences. You may at any time ask for additional information or results from the study. Reasonable precautions will be taken to protect privacy of data transmitted through the Internet.

If you would like more information or have any questions about the research, you can contact me or my supervisor Professor Niki Davis (niki.davis@canterbury.ac.nz). If you have any concerns or complaints about this research, please contact the Chair, Educational Research Human Ethics Committee (use the contact details below). If you are happy to provide me with permission to conduct this research at your school and to participate in the interview you will need to sign the consent form and return it to me by _____. Please retain this information sheet. Thank you for your consideration of this research project.

Pinelopi Zaka, (pinelopi.zaka@pg.canterbury.ac.nz)

Phone: _____

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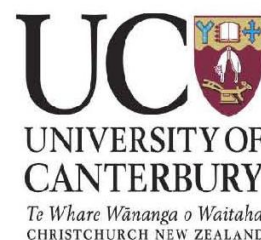
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College of Education

School of Literacies and Arts in Education

Tel: +64 3 343 9606, Fax: + 64 343 7790



Project Title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

School principal Consent Form

I understand the aims and purposes of the research study undertaken by **Pinelopi Zaka**

- The study has been explained to me and I understand the information that was given to me on the information sheet.
- I am aware that participation in this project is voluntary. I have had all questions answered to my satisfaction.
- I understand that my school's involvement will include individual audio recorded interviews with me as the school principal, 3-5 teachers, observations of one classroom, interview with the class teacher and group interviews with 6-8 students of the same classroom.
- I understand that the participants can withdraw from the study at any time, without giving any reason for withdrawing.
- I understand that all information will be treated in strictest confidence, that participants will remain anonymous and that no information that could identify the students or the school will be given to other researchers or agencies. I understand that reasonable precautions have been taken to protect privacy of data transmitted through the internet.
- Any anonymity risks have been explained to me and I understand the precautions that will be taken to minimize potential harm.
- I understand that within these restrictions, the findings will be shared with the school; the findings may also be submitted for publication to national or international journals or presented at educational conferences; that the results of the study can be made available to me at my request and that I can request additional information at any time.
- I understand that the interview with me, as the school principal, will be recorded and I can ask the recording to be stopped any time temporarily or permanently. I may be provided if I wish with a copy of interview transcript to check for accuracy and a summary of the results.
- I have read the information sheet and consent form. I agree to allow the conduction of this study in my school and to participate in the interview.

Name _____

Signature _____ Date _____

***Please return this form in person or through e-mail to Pinelopi Zaka by _____
(pinelopi.zaka@pg.canterbury.ac.nz)***

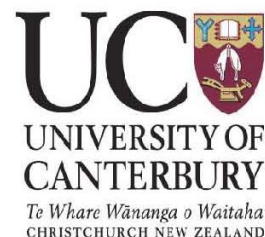
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College of Education

School of Literacies and Arts in Education
Tel: +64 3 343 9606, Fax: + 64 343 7790



Information Sheet for the participants (teachers)

Project title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

My name is Pinelopi Zaka and I am a Masters student at the College of Education, University of Canterbury. My research activity will investigate the implementation of blended teaching and learning approaches (a combination of online and face-to-face learning activities) in New Zealand schools, in order to inform professional and organizational development. Your experience and particular viewpoints will make an important contribution to this research.

As part of the study, I would like to examine teachers' perspectives on their blended teaching experiences at your school. Data will be gathered, with your informed consent, interviewing you on your experiences regarding the implementation of blended teaching and learning at your school.

Your involvement in this project will include an interview on your experience regarding the implementation of blended teaching and learning at your school. The interview will take about 20 minutes and will be audio recorded. You may request the recording to be stopped temporarily or permanently if at any time you feel uncomfortable. As the principal researcher, I will conduct and transcribe the interview, that will be carried out on a place and time that best suits you. You may be provided if you wish with a copy of the interview transcript for review and approval and a summary of the results. Your participation is voluntary and you have the right to withdraw from the project at any time. If you choose to withdraw, I will use my best endeavours to remove any of the information relating to you from the project, including any final publication, provided that this remains practically achievable. The research will not interfere with the normal course schedule.

All information will be treated in strictest confidence, all participants will remain anonymous. All data will be kept by me as the researcher and any data that can identify the participants will not be given to any other researcher or agency. As required by the University's research policy, at the completion of the project all information collected will be retained in secure storage for five years, after which it will be destroyed. The findings of the study, where all participants will remain anonymous, will be shared the school. The results of the study may be submitted for publication to national or international journals or presented at educational conferences. You may at any time ask for additional information or results from the study. Reasonable precautions will be taken to protect privacy of data transmitted through the Internet.

If you would like more information or have any questions about the research, you can contact me or my supervisor Professor Niki Davis (niki.davis@canterbury.ac.nz). If you have any concerns or complaints about this research, please contact the Chair, Educational Research Human Ethics Committee (use the contact details below). If you are happy to take part you will need to sign the consent form and return it to me by _____. Please retain this information sheet. Thank you for your consideration of this research project.

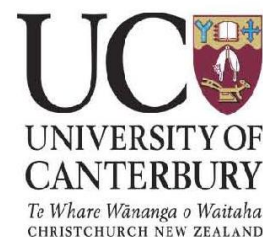
Pinelopi Zaka, (pinelopi.zaka@pg.canterbury.ac.nz)
Phone: _____

This project has received ethical approval from the University of Canterbury, Educational Research Human Ethics Committee.

Complaints may be addressed to:

The Chair,
Educational Research Human Ethics Committee
University of Canterbury, Private Bag 4800, Christchurch
Email: human-ethics@canterbury.ac.nz

College of Education
School of Literacies and Arts in Education
Tel: +64 3 343 9606, Fax: + 64 343 7790



Project Title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

Teachers Consent Form

I understand the aims and purposes of the research study undertaken by **Pinelopi Zaka**

- The study has been explained to me and I understand the information that was given to me on the information sheet.
- I am aware that my participation in this project is voluntary. I have had all questions answered to my satisfaction.
- I understand that my involvement will include an audio recorded interview with the researcher on my experience regarding the implementation of blended teaching and learning at my school.
- I understand that I can withdraw from the study at any time, without giving any reason for withdrawing.
- I understand that all information will be treated in strictest confidence, that participants will remain anonymous and that no information that could identify me will be given to other researchers or agencies. I understand that reasonable precautions have been taken to protect privacy of data transmitted through the internet
- I understand that within these restrictions, the findings will be shared the school; the findings may be submitted for publication to national or international journals or presented at educational conferences; that the results of the study can be made available to me at my request and that I can request additional information at any time.
- I understand that interviews will be recorded and I can ask the recording to be stopped any time temporarily or permanently. I may be provided if I wish with a copy of interview transcript to check for accuracy and a summary of the results.
- I have read the information sheet and consent form. I agree to participate in the study.

Name _____

Signature _____ Date _____

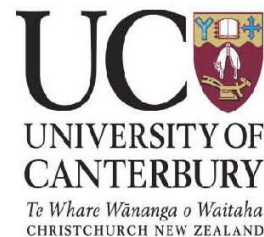
***Please return this form in person or through e-mail to Pinelopi Zaka by _____
(pinelopi.zaka@pg.canterbury.ac.nz)***

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Information Sheet for the participants (teacher of the observed classroom)

Project title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

My name is Pinelopi Zaka and I am a Masters student at the College of Education, University of Canterbury. My research activity will investigate the implementation of blended teaching and learning approaches (a combination of online and face-to-face learning activities) in New Zealand schools, in order to inform professional and organizational development. Your experience and particular viewpoints will make an important contribution to this research.

As part of the study, I would like to examine students' perspectives on their blended learning experiences through your course. Data will be gathered, with students' informed consent, interviewing 6-8 of them in focus groups of 2-3 students, on their experiences throughout the course duration. I will also observe your course's online and face-to-face learning environment. More data will be gathered with your informed consent, by interviewing you on your viewpoints as the teacher on the use of blended teaching and learning approaches at your school and your classroom.

Your involvement in this project will include an interview on your experience as a blended course teacher and any other information you may wish to share, including observation of your course's online and face-to-face learning environment. The interview will take about 20 minutes and will be audio recorded. You may request the recording to be stopped temporarily or permanently if at any time you feel uncomfortable. As the principal researcher, I will conduct and transcribe the interview that will be carried out on a place and time that best suits you. You may be provided of you wish with a copy of the interview transcript for review and approval and a summary of the results. As the researcher, I will also visit your Year 9 Science face-to-face class approximately once a week during term 3, as well as observe your course's online learning environment through remote access, in order to collect data on student participation and interactions with your, their classmates and course content, as well as on your blended teaching practices. Your participation is voluntary and you have the right to withdraw from the project at any time. If you choose to withdraw, I will use my best endeavours to remove any of the information relating to you from the project, including any final publication, provided that this remains practically achievable. The research will not interfere with the normal course schedule.

All information will be treated in strictest confidence, all participants will remain anonymous. As a participant of this study, you will not be anonymous to your school principal, who will be aware of your class' participation, in order to provide permission to carry out the study. To avoid any harm due to this issue, you will be provided with a copy of your interview transcript to check for approval, as well as with a summary of the results.

All data will be kept by me as the researcher and any data that can identify the participants will not be given to any other researcher or agency. As required by the University's research policy, at the completion of the project all information collected will be retained in secure storage for five years, after which it will be destroyed. The findings of the study, where all participants will remain anonymous, will be shared with the school. The results of the study may be submitted for publication to national or international journals or presented at educational conferences. You may at any time ask for additional information or results from the study. Reasonable precautions will be taken to protect privacy of data transmitted through the Internet.

If you would like more information or have any questions about the research, you can contact me or my supervisor Professor Niki Davis (niki.davis@canterbury.ac.nz). If you have any concerns or complaints about this research, please contact the Chair, Educational Research Human Ethics Committee (use the contact details below). If you are happy to

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take part you will need to sign the consent form and return it to me by _____. Please retain this information sheet. Thank you for your consideration of this research project.

Pinelopi Zaka, (pinelopi.zaka@pg.canterbury.ac.nz)

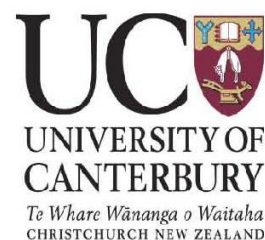
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Project Title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

Teacher of the observed classroom Consent Form

I understand the aims and purposes of the research study undertaken by **Pinelopi Zaka**

- The study has been explained to me and I understand the information that was given to me on the information sheet.
- I am aware that my participation in this project is voluntary. I have had all questions answered to my satisfaction.
- I understand that my involvement will include an audio recorded interview with the researcher on my experience of the use of blended approaches to facilitate student learning, as well as observation of my course's online and face-to-face learning environment.
- I understand that I can withdraw from the study at any time, without giving any reason for withdrawing.
- I understand that all information will be treated in strictest confidence, that participants will remain anonymous and that no information that could identify me will be given to other researchers or agencies. I understand that reasonable precautions have been taken to protect privacy of data transmitted through the internet
- Any anonymity risks have been explained to me and I understand the precautions that will be taken to minimize potential harm.
- I understand that within these restrictions, the findings will be shared with the school; the findings may be submitted for publication to national or international journals or presented at educational conferences; that the results of the study can be made available to me at my request and that I can request additional information at any time.
- I understand that the interview will be recorded and I can ask the recording to be stopped any time temporarily or permanently. I may be provided if I wish with a copy of interview transcript to check for accuracy and a summary of the results.
- I have read the information sheet and consent form. I agree to participate in the study.

Name _____

Signature _____ Date _____

Please return this form in person or through e-mail to Pinelopi Zaka by _____
(pinelopi.zaka@pg.canterbury.ac.nz)

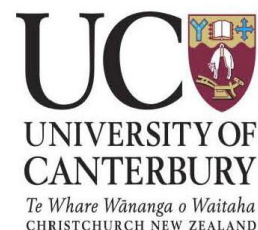
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Information Sheet for the participants (students)

Project title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

My name is Pinelopi Zaka, I am a Masters student at the College of Education, University of Canterbury. I am researching blended teaching and learning (which includes online and face-to-face learning activities) in New Zealand schools, to help improve the use of this approach at schools.

As part of the study, I would like to examine your perspectives on blended learning at your Year 9 Science class and your school in general. I will collect data, with your informed consent, by interviewing you in groups of 2-3 students and by observing your Year 9 Science blended course. Your learning experiences and viewpoints will make an important contribution to this research.

Your involvement in this project will include participation in a group interview of 2-3 students with me, including observation of your blended course, where online and face-to-face learning activities take place. The interview will be audio recorded and you may ask that the recording to be stopped any time. The interview will take about 20 minutes and it will be carried out at school on a time that best suits you, without interfering with your normal course schedule. As the researcher, I will also visit your Year 9 Science face-to-face class approximately once a week during term 3, as well as observe your course's online learning environment through remote access, in order to collect data on your participation and interactions with your teacher, classmates and course content. Your participation is voluntary and you have the right to withdraw from the study at any time without penalty. If you withdraw, I will do my best to remove any information relating to you, provided this is practically achievable.

All information will be kept confidential and all participants will remain anonymous. As the students in each group interview will not be anonymous to each other, before the interview, you and the rest of the students in the group will be reminded of the importance of retaining anonymity and confidentiality of students' responses and no questions on private or sensitive issues will be included.

Only I as the researcher will have access to the information you will give me and any data that may identify you will not be given to any other researcher or agency. As required by the University's research policy, the data will be held securely and kept for a minimum period of 5 years following completion of the project before being destroyed. The findings of the study, where all participants will remain anonymous will be shared with your school and may be submitted for publication to national or international journals or presented at educational conferences. Reasonable precautions will be taken to protect privacy of data transmitted through the Internet. You may at any time ask for additional information or a summary of the results from the study.

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If you would like more information or have any questions about the research, you can contact me or my supervisor Professor Niki Davis (niki.davis@canterbury.ac.nz). If you have any concerns or complaints about this research, please contact the Chair, Educational Research Human Ethics Committee (use the contact details below). If you are happy to take part you will need to sign the consent form and return it to me or your teacher, along with your parent's/guardian's signed consent form by _____. Please retain this information sheet. Thank you for your consideration of this research project.

Pinelopi Zaka (pinelopi.zaka@pg.canterbury.ac.nz)

Phone: _____

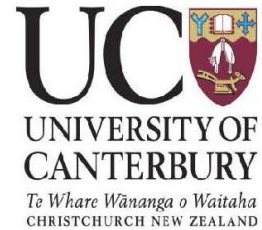
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Project Title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

Student Consent Form

(Please tick each box)

- ☐ I have read the information sheet and understand what will be required of me if I participate in this project.
- ☐ I understand that the group discussions will be audio-recorded.
- ☐ I have read the information letter and understand that all information collected will only be accessed by the researcher and that it will be kept confidential and secure.
- ☐ I understand that neither I, nor my school will be identified in any presentations or publications that draw on this research.
- ☐ I understand that the findings of the study, where all participants will remain anonymous, will be shared with my school and that I may ask for a summary of the results.
- ☐ I understand that if I participate in the group interview it is important to retain anonymity and confidentiality of students' responses.
- ☐ I understand that my participation is voluntary and I may choose to withdraw at any time. Whether or not I decide to participate is mine and my parent's/guardian's decision and will not affect my grade.
- ☐ I understand that I can get more information about this project from the researcher, and that I can contact the University of Canterbury Educational Research Human Ethics Committee if I have any complaints about the research.
- ☐ I agree to participate in this research and my parent/guardian has also given consent on their consent form.

Full name _____

Signature _____ **Date** _____

Please return this form along with your parent's/guardian's signed consent form in the envelope provided to _____ or via e-mail to Pinelopi Zaka (pinelopi.zaka@pg.canterbury.ac.nz) by _____.

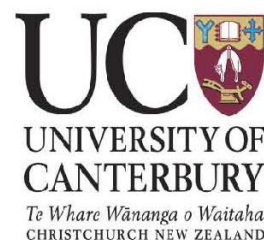
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Information Sheet for parents/guardians

Project title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

My name is Pinelopi Zaka and I am a Masters student at the College of Education, University of Canterbury. My research activity will investigate the implementation of blended teaching and learning approaches (a combination of online and face-to-face learning activities) in New Zealand schools, to inform professional and organizational development. I would like your child to participate in this research, which aims to improve secondary education including opportunities for your child.

As part of the study, I will examine students' perspectives on their blended learning experience through their Year 9 Science course and at their school in general. Data will be gathered, with students' informed consent, by interviewing them in groups of 2-3 students on their experiences throughout the blended course duration, as well as observations of their course's online and face-to-face learning environment.

Students' involvement in this project will include a focus group interview of 2-3 students with me, the researcher, on their blended learning experience and being observed in the course's online and face-to-face learning environment. The interview will be audio recorded and students will be able to request the recording to be stopped anytime. The interview will take about 20 minutes and will be carried out at school on a time that best suits the students, without interfering with their normal course schedule. As the researcher, I will also visit students' Year 9 Science face-to-face class approximately once a week during term 3, as well as observe their course's online learning environment through remote access, in order to collect data on their participation and interactions with their teacher, classmates and course content. Their participation is voluntary and they have the right to withdraw from the project at any time. If your child chooses to withdraw, I will use my best endeavours to remove any of the information relating to him/her from the project, including any final publication, provided that this remains practically achievable. The research will not interfere with the normal course schedule.

All information will be treated in strictest confidence, all participants will remain anonymous. There is a small risk to complete anonymity, as the students will not remain anonymous to each other during the group interviews. To minimize any risk due to this issue, at the beginning of the interview the students will be reminded of the importance of retaining anonymity and confidentiality of students' responses, while student maturity, combined with the nature of the questions that will avoid discussion on private or sensitive issues will minimize the potential harm.

All data will be kept by me as the researcher, and any data that can identify the participants will not be given to any other researcher or agency. As required by the University's research policy, at the completion of the project all information collected will be retained in secure storage for five years, after which it will be destroyed. The findings of the study, where all participants will remain anonymous, will be shared with the school. The results of the study may be submitted for publication to national or international journals or presented at educational conferences. You may at any time ask for additional information or results from the study. Reasonable precautions will be taken to protect privacy of data transmitted through the Internet.

If you would like more information or have any questions about the research, you can contact me or my supervisor Professor Niki Davis (niki.davis@canterbury.ac.nz). If you have any concerns or complaints about this research, please contact the Chair, Educational Research Human Ethics Committee (use the contact details below). If you are happy to provide me with permission to conduct this research with your child please to sign the consent form and return it to me

This project has received ethical approval from the University of Canterbury, Educational Research Human Ethics Committee.

Complaints may be addressed to:

The Chair,
Educational Research Human Ethics Committee
University of Canterbury, Private Bag 4800, Christchurch
Email: human-ethics@canterbury.ac.nz

or your child's Year 9 Science teacher, along with your child's signed consent form by _____. Please retain this information sheet. Thank you for your consideration of this research project.

Pinelopi Zaka, (pinelopi.zaka@pg.canterbury.ac.nz)

Phone:

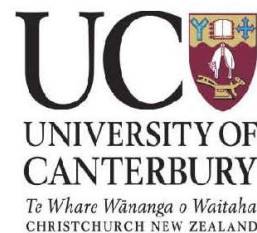
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Project Title: Blended online schooling: A case study to investigate blended teaching and learning implementation in a New Zealand high school

Consent Form (Parent/guardian)

I understand the aims and purposes of the research study undertaken by *Pinelopi Zaka*

- The study has been explained to me and I understand the information that was given to me on the information sheet.
- I understand what will be required of my child. I understand that participation in this project is voluntary and that I can withdraw my child or he/she can withdraw from the project at any time without repercussions.
- I understand that anything my child says during this research project will be treated as confidential. No findings that could identify my child or his/her school will be published.
- Any anonymity risks have been explained to me and I understand the precautions that will be taken to minimize potential harm.
- I understand that within these restrictions, the findings will be shared with the school; the findings may also be submitted for publication to national or international journals or presented at educational conferences; that the results of the study can be made available to me at my request and that I can request additional information at any time.
- I understand that the study will be carried out as described in the information statement, a copy of which I have retained. I realise that whether or not my child participates is mine and my child's decision and will not affect his/her grade.
- I have discussed this project with _____ and am happy that he/she understands what he/she will be asked to do and that he/she can withdraw at any stage.

Name _____

Signature _____ Date _____

Please return this form along with your child's signed consent form in the envelope provided to _____ or via e-mail to Pinelopi Zaka (pinelopi.zaka@pg.canterbury.ac.nz) by _____.

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